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AuditAce
FROM INCEPTION TO SUCCESS

Smart Contract Audit

FOR

DarkMoon

DATED : 4 Oct 23'

High Risk

Centralization – Enabling Trades

Severity: High

function: **EnableTrading**

Status: Open

Overview:

The **EnableTrading** function permits only the contract owner to activate trading capabilities. Until this function is executed, no investors can buy, sell, or transfer their tokens. This places a high degree of control and centralization in the hands of the contract owner.

```
function EnableTrading() external onlyOwner {
    require(!tradingEnabled, "Cannot re-enable trading");
    tradingEnabled = true;
    providingLiquidity = true;
    genesis_block = block.number;
}
```

Suggestion

To reduce centralization and potential manipulation, consider one of the following approaches:

1. Automatically enable trading after a specified condition, such as the completion of a presale, is met.
2. If manual activation is still desired, consider transferring the ownership of the contract to a trustworthy, third-party entity like a certified "PinkSale Safu" developer. This can provide investors with more confidence in the eventual activation of trading capabilities, mitigating concerns of potential bad faith actions by the original owner

AUDIT SUMMARY

Project name – DarkMoon

Date: 4 Oct, 2023

Scope of Audit- Audit Ace was consulted to conduct the smart contract audit of the solidity source codes.

Audit Status: **Passed With High Risk**

Issues Found

Status	Critical	High	Medium	Low	Suggestion
Open	0	1	1	0	0
Acknowledged	0	0	0	0	0
Resolved	0	0	0	0	0

USED TOOLS

Tools:

1- Manual Review:
A line by line code review has been performed by audit ace team.

2- BSC Test Network: All tests were conducted on the BSC Test network, and each test has a corresponding transaction attached to it. These tests can be found in the "Functional Tests" section of the report.

3- Slither :
The code has undergone static analysis using Slither.

Testnet version:
The tests were performed using the contract deployed on the BSC Testnet, which can be found at the following address:
https://testnet.bscscan.com/token/0x8eFa87BfF06532
8678fF973cE27f3abAC619b69e

Token Information

Token Name : DarkMoon

Token Symbol: Moon

Decimals: 9

Token Supply: 1,000,000

Token Address:
0x44CCf95ea9161a91ABEB26dED18EabB8090784a4

Checksum:
f1c3cb841514c1aadcf11d34d03046b96b491056

Owner:
0xc2e8eF6f1800149E4E741efd0B7E82be64E939A3
(at time of writing the audit)

Deployer:
0xc2e8eF6f1800149E4E741efd0B7E82be64E939A3

TOKEN OVERVIEW

Fees:

Buy Fees: 0-5%

Sell Fees: 0-10%

Transfer Fees: 0-5%

Fees Privilege: Owner

Ownership: owned

Minting: No mint function

Max Tx Amount/ Max Wallet Amount: No

Blacklist: No

Other Privileges: Initial distribution of the tokens

Enabling trades

Modifying fees

AUDIT METHODOLOGY

The auditing process will follow a routine as special considerations by Auditace:

- Review of the specifications, sources, and instructions provided to Auditace to make sure the contract logic meets the intentions of the client without exposing the user's funds to risk.
- Manual review of the entire codebase by our experts, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
- Specification comparison is the process of checking whether the code does what the specifications, sources, and instructions provided to Auditace describe.
- Test coverage analysis determines whether the test cases are covering the code and how much code isexercised when we run the test cases.
- Symbolic execution is analysing a program to determine what inputs cause each part of a program to execute.
- Reviewing the codebase to improve maintainability, security, and control based on the established industry and academic practices.

VULNERABILITY CHECKLIST

- [x] Return values of low-level calls
- [x] Private modifier
- [x] Multiple Sends
- [x] Using Suicide
- [x] Gas Limitand Loops
- [x] Address hardcoded
- [x] Exception Disorder
- [x] Using inline assembly
- [x] Divide before multiply
- [x] Missing Zero Address Validation
- [x] Compiler version not fixed
- [x] **Gasless Send**
- [x] Using block.timestamp
- [x] Re-entrancy
- [x] Tautology or contradiction
- [x] Timestamp Dependence
- [x] Revert/require functions
- [x] Use of tx.origin
- [x] Integer overflow/underflow
- [x] Dangerous strict equalities
- [x] Using SHA3
- [x] Using throw

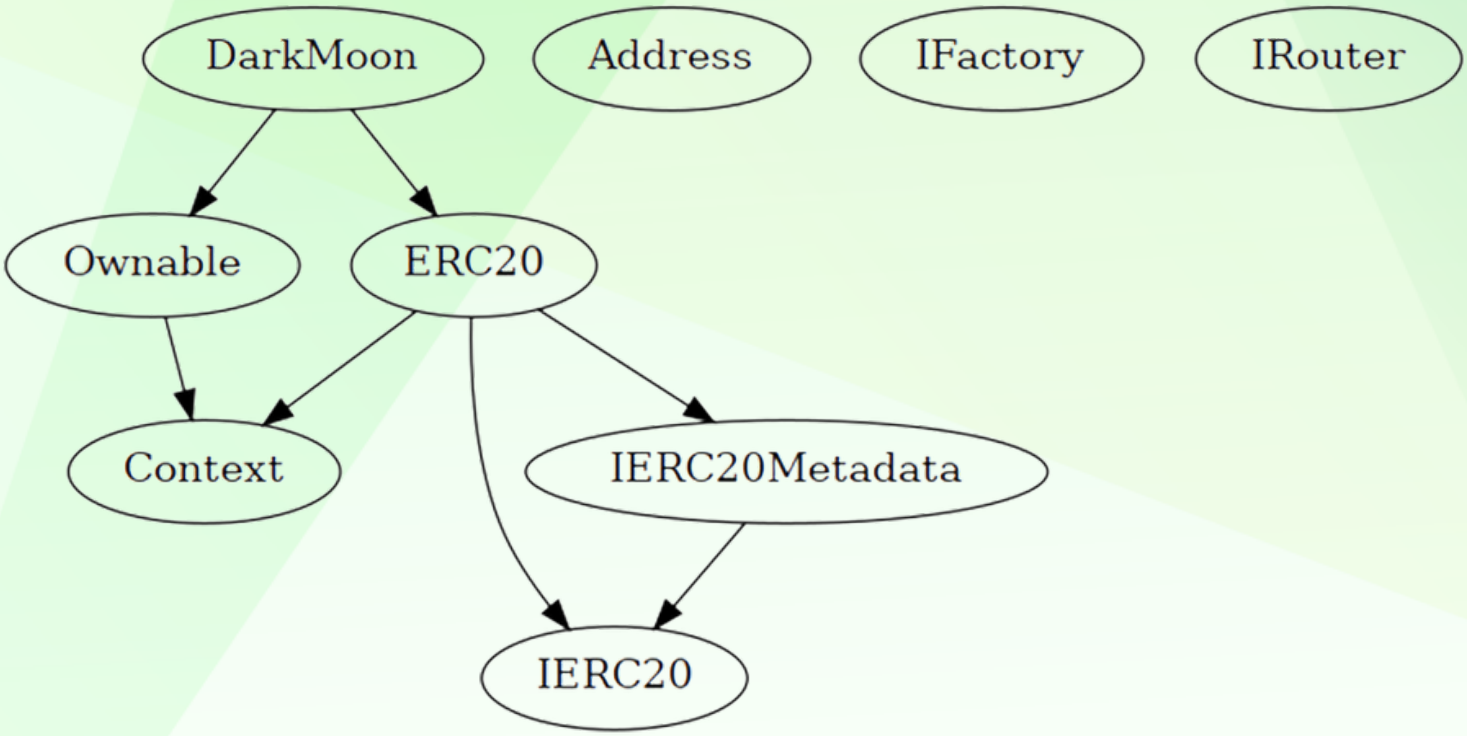
CLASSIFICATION OF RISK

Severity	Description
Critical	These vulnerabilities could be exploited easily and can lead to asset loss, data loss, asset, or data manipulation. They should be fixed right away.
High-Risk	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.
Medium-Risk	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.
Low-Risk	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.
Gas Optimization /Suggestion	A vulnerability that has an informational character but is not affecting any of the code.

Findings

Severity	Found
Critical	0
High-Risk	1
Medium-Risk	1
Low-Risk	0
Gas Optimization / Suggestions	0

INHERITANCE TREE



POINTS TO NOTE

- **Owner is able to adjust buy/transfer fees within 0-5%**
- **Owner is able to adjust sell fees within 0 – 10%**
- Owner is not able to blacklist an arbitrary wallet
- Owner is not able to disable trades
- Owner is not able to mint new tokens
- Owner is not able to set maximum wallet and maximum buy/sell/transfer limits
- **Owner must enable trades manually**

CONTRACT ASSESMENT

Contract	Type	Bases		
	└	**Function Name**	**Visibility**	**Mutability**	**Modifiers**
Context	Implementation				
	└	_msgSender	Internal 🔒		
	└	_msgData	Internal 🔒		
IERC20	Interface				
	└	totalSupply	External ❗		NO ❗	
	└	balanceOf	External ❗		NO ❗	
	└	transfer	External ❗	🔴	NO ❗	
	└	allowance	External ❗		NO ❗	
	└	approve	External ❗	🔴	NO ❗	
	└	transferFrom	External ❗	🔴	NO ❗	
IERC20Metadata	Interface	IERC20			
	└	name	External ❗		NO ❗	
	└	symbol	External ❗		NO ❗	
	└	decimals	External ❗		NO ❗	
ERC20	Implementation	Context, IERC20, IERC20Metadata			
	└	<Constructor>	Public ❗	🔴	NO ❗	
	└	name	Public ❗		NO ❗	
	└	symbol	Public ❗		NO ❗	
	└	decimals	Public ❗		NO ❗	
	└	totalSupply	Public ❗		NO ❗	
	└	balanceOf	Public ❗		NO ❗	
	└	transfer	Public ❗	🔴	NO ❗	
	└	allowance	Public ❗		NO ❗	
	└	approve	Public ❗	🔴	NO ❗	
	└	transferFrom	Public ❗	🔴	NO ❗	
	└	increaseAllowance	Public ❗	🔴	NO ❗	
	└	decreaseAllowance	Public ❗	🔴	NO ❗	
	└	_transfer	Internal 🔒	🔴		
	└	_tokengeneration	Internal 🔒	🔴		
	└	_approve	Internal 🔒	🔴		
Address	Library				
	└	sendValue	Internal 🔒	🔴		

CONTRACT ASSESMENT

Ownable	Implementation	Context		
└	<Constructor>	Public ❗	🛑	NO❗
└	owner	Public ❗		NO❗
└	renounceOwnership	Public ❗	🛑	onlyOwner
└	transferOwnership	Public ❗	🛑	onlyOwner
└	_setOwner	Private 🔐	🛑	
IFactory	Interface			
└	createPair	External ❗	🛑	NO❗
IRouter	Interface			
└	factory	External ❗		NO❗
└	WETH	External ❗		NO❗
└	addLiquidityETH	External ❗	💵	NO❗
└	swapExactTokensForETHSupportingFeeOnTransferTokens	External ❗	🛑	NO❗
DarkMoon	Implementation	ERC20, Ownable		
└	<Constructor>	Public ❗	🛑	ERC20
└	approve	Public ❗	🛑	NO❗
└	transferFrom	Public ❗	🛑	NO❗
└	increaseAllowance	Public ❗	🛑	NO❗
└	decreaseAllowance	Public ❗	🛑	NO❗
└	transfer	Public ❗	🛑	NO❗
└	_transfer	Internal 🔒	🛑	
└	Liquify	Private 🔐	🛑	lockTheSwap
└	swapTokensForETH	Private 🔐	🛑	
└	addLiquidity	Private 🔐	🛑	
└	updateLiquidityProvide	External ❗	🛑	onlyOwner
└	updateLiquidityTreshhold	External ❗	🛑	onlyOwner
└	EnableTrading	External ❗	🛑	onlyOwner
└	updatedeadline	External ❗	🛑	onlyOwner
└	updateDevWallet	External ❗	🛑	onlyOwner
└	updateTax	External ❗	🛑	onlyOwner
└	updateExemptFee	External ❗	🛑	onlyOwner
└	bulkExemptFee	External ❗	🛑	onlyOwner
└	rescueBNB	External ❗	🛑	onlyOwner
└	rescueBEP20	External ❗	🛑	onlyOwner
└	<Receive Ether>	External ❗	💵	NO❗

CONTRACT ASSESMENT

Legend

Symbol	Meaning
🛑	Function can modify state
💵	Function is payable

STATIC ANALYSIS

```
Reentrancy in DarkMoon.transferFrom(address,address,uint256) (contracts/Token.sol#489-504):
        External calls:
        - _transfer(sender,recipient,amount) (contracts/Token.sol#494)
                - router.addLiquidityETH{value: ethAmount}(address(this),tokenAmount,0,0,deadWallet,block.timestamp) (contracts/Token.sol#660-667)
                - (success) = recipient.call{value: amount}() (contracts/Token.sol#343)
                - router.swapExactTokensForETHSupportingFeeOnTransferTokens(tokenAmount,0,path,address(this),block.timestamp) (contracts/Token.sol#646-652)
                - address(devWallet).sendValue(devAmt) (contracts/Token.sol#632)
        External calls sending eth:
        - _transfer(sender,recipient,amount) (contracts/Token.sol#494)
                - router.addLiquidityETH{value: ethAmount}(address(this),tokenAmount,0,0,deadWallet,block.timestamp) (contracts/Token.sol#660-667)
                - (success) = recipient.call{value: amount}() (contracts/Token.sol#343)
        Event emitted after the call(s):
        - Approval(owner,spender,amount) (contracts/Token.sol#332)
                - _approve(sender,_msgSender(),currentAllowance - amount) (contracts/Token.sol#501)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-vulnerabilities-3
INFO:Detectors:
Context._msgData() (contracts/Token.sol#13-16) is never used and should be removed
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#dead-code
INFO:Detectors:
Pragma version^0.8.17 (contracts/Token.sol#6) allows old versions
solc-0.8.17 is not recommended for deployment
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#incorrect-versions-of-solidity
INFO:Detectors:
Low level call in Address.sendValue(address,uint256) (contracts/Token.sol#337-348):
        - (success) = recipient.call{value: amount}() (contracts/Token.sol#343)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#low-level-calls
INFO:Detectors:
Variable ERC20._balances (contracts/Token.sol#69) is not in mixedCase
Variable ERC20._allowances (contracts/Token.sol#71) is not in mixedCase
Function IRouter.WETH() (contracts/Token.sol#401) is not in mixedCase
Function DarkMoon.Liquify(uint256,DarkMoon.Taxes) (contracts/Token.sol#596-635) is not in mixedCase
Parameter DarkMoon.updateLiquidityTreshhold(uint256).new_amount (contracts/Token.sol#674) is not in mixedCase
Function DarkMoon.EnableTrading() (contracts/Token.sol#682-687) is not in mixedCase
Parameter DarkMoon.updatedeadline(uint256)._deadline (contracts/Token.sol#689) is not in mixedCase
Parameter DarkMoon.updateExemptFee(address,bool)._address (contracts/Token.sol#718) is not in mixedCase
Variable DarkMoon.genesis_block (contracts/Token.sol#436) is not in mixedCase
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#conformance-to-solidity-naming-conventions
INFO:Detectors:
Redundant expression "this (contracts/Token.sol#14)" inContext (contracts/Token.sol#8-17)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#redundant-statements
INFO:Detectors:
DarkMoon.launchtax (contracts/Token.sol#438) should be constant
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-variables-that-could-be-declared-constant
INFO:Detectors:
DarkMoon.pair (contracts/Token.sol#428) should be immutable
DarkMoon.router (contracts/Token.sol#427) should be immutable
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-variables-that-could-be-declared-immutable
```

Result => A static analysis of contract's source code has been performed using slither,

No major issues were found in the output

FUNCTIONAL TESTING

1- Adding liquidity (passed):

https://testnet.bscscan.com/tx/0x3b855a5a7c338a1e6f29667f60aeb53007f9a154dbe1f1bde72d26ee65472991

2- Buying when excluded (0% tax) (passed):

https://testnet.bscscan.com/tx/0xbef0bea2002ede149d86dcea0643d0875b3befc6618247ad071a44ac6edf900b

3- Selling when excluded (0% tax) (passed):

https://testnet.bscscan.com/tx/0x9000780e58f4af7423534855b05d3884dfaa7542c30a7d4e8dfeec6a725fae1d

4- Transferring when excluded from fees (0% tax) (passed):

https://testnet.bscscan.com/tx/0x1f61ecf1631d3a37ef6809b27fde238ba9d59e44d84683f00a0f70e98785d6daz

5- Buying when not excluded from fees (tax 0-5%) (passed):

https://testnet.bscscan.com/tx/0x2b2117b0c55718ca2c30c7a6c606345abac691a24da2896a472a346c71b3bc06

6- Selling when not excluded from fees (tax 0-10%) (passed):

https://testnet.bscscan.com/tx/0x7621c8ffa1fb843838bc23a0e5bec65a57d0906c4fda969106b6b5aa6e092100

FUNCTIONAL TESTING

7- Transferring when not excluded from fees (0-5% tax) (passed):

https://testnet.bscscan.com/tx/0x99d0dc63a3a8a46f8601b6fb6748cac353aad2ac6ce9128241b1bfd8f7e30589

8- Internal swap (BNB set to dev wallet + Auto-liquidity) (passed):

https://testnet.bscscan.com/tx/0x7621c8ffa1fb843838bc23a0e5bec65a57d0906c4fda969106b6b5aa6e092100

High Risk

Centralization – Enabling Trades

Severity: High

function: **EnableTrading**

Status: Open

Overview:

The **EnableTrading** function permits only the contract owner to activate trading capabilities. Until this function is executed, no investors can buy, sell, or transfer their tokens. This places a high degree of control and centralization in the hands of the contract owner.

```
function EnableTrading() external onlyOwner {
    require(!tradingEnabled, "Cannot re-enable trading");
    tradingEnabled = true;
    providingLiquidity = true;
    genesis_block = block.number;
}
```

Suggestion

To reduce centralization and potential manipulation, consider one of the following approaches:

1. Automatically enable trading after a specified condition, such as the completion of a presale, is met.
2. If manual activation is still desired, consider transferring the ownership of the contract to a trustworthy, third-party entity like a certified "PinkSale Safu" developer. This can provide investors with more confidence in the eventual activation of trading capabilities, mitigating concerns of potential bad faith actions by the original owner

Medium Risk

Logical – Updating swap threshold

Severity: Medium

function: **updateLiquidityThreshold**

Status: Open

Overview:

updateLiquidityThreshold requires new swap threshold to be less than 1e7 which is equal to 10x of total supply while error message indicates that new swap threshold amount must be less than 1% of total supply (1e5)

```
function updateLiquidityTreshhold(uint256 new_amount) external onlyOwner {
    require(
        new_amount <= 1e7,
        "Swap threshold amount should be lower or equal to 1% of tokens"
    );
    tokenLiquidityThreshold = new_amount * 10 ** decimals();
}
```

Suggestion

Change condition to be compatible with the error message:

```
function updateLiquidityTreshhold(uint256 new_amount) external onlyOwner {
    require(
        new_amount <= 1e5,
        "Swap threshold amount should be lower or equal to 1% of tokens"
    );
    tokenLiquidityThreshold = new_amount * 10 ** decimals();
}
```

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