ARK

Smart Contract Audit Report

SYSFIXED

17 Dec 2022

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AUDITED DETAILS

Audited Project

Project name	Token ticker	Blockchain
ARK	ARKFI	Binance Smart Chain

Addresses

Contract address	0x111120a4cfacf4c78e0d6729274fd5a5ae2b1111
Contract deployer address	0x810C5704d0b10254d36440c773402180ed973dd0

Project Website

https://www.arkfi.io/

Codebase

https://bscscan.com/address/0x111120a4cfacf4c78e0d6729274fd5a5ae2b1111#code

SUMMARY

Ark Fi products and smart contracts are built on the BSC layer one blockchain for its' security, decentralization, low gas fees, and compatibility with Ethereum Virtual Machine (EVM). The native token BNB and stable coin BUSD are available on the Binance CEX and several other major exchanges worldwide. The BSC has made a name for itself in the DeFi space as a reliable, low-cost, and secure solution for decentralized applications. By launching on BSC, Ark Fi taps into a large community of users and liquidity that will speed the adoption and early growth of the protocol.

Contract Summary

Documentation Quality

ARK 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 ARK with the discovery of several low issues.

Test Coverage

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

Audit Findings Summary

- SWC-101 | It is recommended to use vetted safe math libraries for arithmetic operations consistently on lines 48, 48, 123, 131, 143, 170, 170, 172, 172, 173, 173, 173, 173, 186, 187, 193, 194, 195, 200, 201, 202 and 264.

CONCLUSION

We have audited the ARK project released on December 2022 to discover issues and identify potential security vulnerabilities in ARK 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 ARK 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 arithmetic operation issues. It is recommended to use vetted safe math libraries for arithmetic operations consistently throughout the smart contract system.

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.	PASS
Integer Overflow and Underflow	SWC-101	If unchecked math is used, all math operations should be safe from overflows and underflows.	ISSUE FOUND
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.	PASS
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 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	Friday Dec 16 2022 12:26:51 GMT+0000 (Coordinated Universal Time)
Finished	Saturday Dec 17 2022 11:06:40 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	ARK_TOKEN.sol

Detected Issues

ID	Title	Severity	Status
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "**" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-=" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-=" DISCOVERED	low	acknowledged

SWC-101	ARITHMETIC OPERATION "+=" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+=" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+=" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+=" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+=" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 48

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
47   uint8 private constant _decimals = 18;
48   uint256 private _totalSupply = 800_000 * (10**_decimals);
49
50   mapping(address => uint256) private _balances;
51   mapping(address => mapping(address => uint256)) private _allowances;
52
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 48

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
47   uint8 private constant _decimals = 18;
48   uint256 private _totalSupply = 800_000 * (10**_decimals);
49
50   mapping(address => uint256) private _balances;
51   mapping(address => mapping(address => uint256)) private _allowances;
52
```

SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 123

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
122   require(spender != address(0), "Can't use zero address here");
123   _allowances[msg.sender][spender]  = allowance(msg.sender, spender) + addedValue;
124   emit Approval(msg.sender, spender, _allowances[msg.sender][spender]);
125   return true;
126   }
127
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 131

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
130   require(allowance(msg.sender, spender) >= subtractedValue, "Can't subtract more
than current allowance");
131   _allowances[msg.sender][spender]  = allowance(msg.sender, spender) -
subtractedValue;
132   emit Approval(msg.sender, spender, _allowances[msg.sender][spender]);
133   return true;
134   }
135
```

SWC-101 | ARITHMETIC OPERATION "-=" DISCOVERED

LINE 143

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
142   require(_allowances[sender][msg.sender] >= amount, "Insufficient Allowance");
143   _allowances[sender][msg.sender] -= amount;
144   emit Approval(sender, msg.sender, _allowances[sender][msg.sender]);
145   }
146
147
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 170

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
169   function takeTax(address sender, uint256 amount) internal returns (uint256){
170   _transfer(sender, pair, amount * liqTax / 100);
171   IDEXPair(pair).sync();
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 170

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
169   function takeTax(address sender, uint256 amount) internal returns (uint256){
170   _transfer(sender, pair, amount * liqTax / 100);
171   IDEXPair(pair).sync();
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 172

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
171   IDEXPair(pair).sync();
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174   }
175
176
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 172

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
171   IDEXPair(pair).sync();
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174   }
175
176
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 173

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174   }
175
176   function checkSwap(address sender, address recipient) internal view returns (bool)
{
177
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 173

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174   }
175
176   function checkSwap(address sender, address recipient) internal view returns (bool)
{
177
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 173

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174   }
175
176   function checkSwap(address sender, address recipient) internal view returns (bool)
{
177
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 173

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174   }
175
176   function checkSwap(address sender, address recipient) internal view returns (bool)
{
177
```

SWC-101 | ARITHMETIC OPERATION "-=" DISCOVERED

LINE 186

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
185   require(amount <= _balances[sender], "Can't transfer more than you own");
186   _balances[sender] -= amount;
187   _balances[recipient] += amount;
188   emit Transfer(sender, recipient, amount);
189   return true;
190
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 187

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
186   _balances[sender] -= amount;
187   _balances[recipient] += amount;
188   emit Transfer(sender, recipient, amount);
189   return true;
190   }
191
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 193

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
192   function _swapTopUp(uint256 amountNeeded) internal {
193   uint256 howMuchIsMissing = amountNeeded - _balances[swap];
194   _balances[swap] += howMuchIsMissing;
195   _totalSupply += howMuchIsMissing;
196   emit SwapToppedUp(howMuchIsMissing);
197
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 194

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
193   uint256 howMuchIsMissing = amountNeeded - _balances[swap];
194   _balances[swap] += howMuchIsMissing;
195   _totalSupply += howMuchIsMissing;
196   emit SwapToppedUp(howMuchIsMissing);
197   }
198
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 195

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
194   _balances[swap] += howMuchIsMissing;
195   _totalSupply += howMuchIsMissing;
196   emit SwapToppedUp(howMuchIsMissing);
197   }
198
199
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 200

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
199   function _vaultTopUp(address vaultAddress, uint256 amountNeeded) internal {
200   uint256 howMuchIsMissing = amountNeeded - _balances[vaultAddress];
201   _balances[vaultAddress] += howMuchIsMissing;
202   _totalSupply += howMuchIsMissing;
203   emit VaultToppedUp(vaultAddress, howMuchIsMissing);
204
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 201

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
200   uint256 howMuchIsMissing = amountNeeded - _balances[vaultAddress];
201   _balances[vaultAddress] += howMuchIsMissing;
202   _totalSupply += howMuchIsMissing;
203   emit VaultToppedUp(vaultAddress, howMuchIsMissing);
204   }
205
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 202

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
201   _balances[vaultAddress] += howMuchIsMissing;
202   _totalSupply += howMuchIsMissing;
203   emit VaultToppedUp(vaultAddress, howMuchIsMissing);
204   }
205
206
```

SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 264

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- ARK_TOKEN.sol

Locations

```
263   vaultTax = newVaultTax;
264   require(liqTax + vaultTax <= 100, "Taxes can't exceed 100%");
265   emit TaxesChanged(liqTax, vaultTax);
266   }
267
268
```

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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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