



SMART CONTRACT AUDIT

 @Vital-Block

 @VB_Audit

 info@vitalblock.org

 www.vitalblock.org



PREPARED FOR:
APSOCOIN



INTRODUCTION

Auditing Firm	VITAL BLOCK SECURITY
Client Firm	APSOCOIN
Methodology	Automated Analysis, Manual Code Review
Language	.Move
Contract	0xc81caa7cd37c4adf61764b3e47dfa8d9a94fbeb96ca9e5fbf88befde4cff3c12
Blockchain	Aptos Blockchain
Centralization	Active ownership
Website	https://www.apsocoin.com/
Discord	https://discord.gg/Zn3UpPGHWz
Twitter	https://twitter.com/apsocoin
Medium	TBA
Prelim Report Date	February 02, 2023
Final Report Date	February 04, 2023



Verify the authenticity of this report on our GitHub Repo: <https://www.github.com/vital-block>

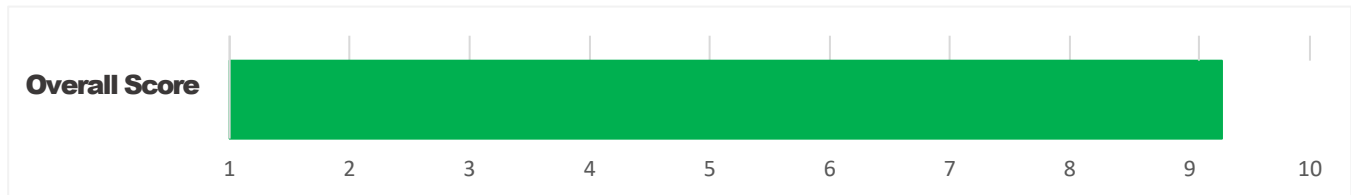


EXECUTIVE SUMMARY

Vital Block has performed the automated and manual analysis of the Move code. The code was reviewed for common contract vulnerabilities and centralized exploits. Here's a quick audit summary:

Status	Critical ! 🔴	Major " 🟡	Medium # 🟡	Minor \$ 🟢	Unknown % 🟤
Open	0	0	0	3	0
Acknowledged	0	0	1	2	0
Resolved	0	0	0	0	0
Noteworthy OnlyOwner Privileges.	Set Taxes and Ratios, Airdrop, Set Protection Settings, Set Reward Properties, Set Reflector Settings, Set Swap Settings, Set Pair and Router				

APTOS DEFI smart contract has achieved the following score: **9.2**



i Please note that smart contracts deployed on blockchains aren't resistant to exploits, vulnerabilities and/or hacks. Blockchain and cryptography assets utilize new and emerging technologies. These technologies present a high level of ongoing risks. For a detailed understanding of risk severity, source code vulnerability, and audit limitations, kindly review the audit report thoroughly.

i Please note that centralization privileges regardless of their inherited risk status - constitute an elevated impact on smart contract safety and security.



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SCOPE OF WORK

Vital Block was consulted by APSOCOIN to conduct the smart contract audit of its MOVE source code. The audit scope of work is strictly limited to mentioned MOVE file only:

- APSOCOIN.move

 External contracts and/or interfaces dependencies are not checked due to being out of scope.

Verify audited contract's contract address and deployed link below:

Public Contract Link	
0xc81caa7cd37c4adf61764b3e47dfa8d9a94fbeb96ca9e5fbf88befde4cff3c12	
Contract Name	APSOCOIN
Token Symbol	APSO
MAX Supply	450,000,000,000



AUDIT METHODOLOGY

Smart contract audits are conducted using a set of standards and procedures. Mutual collaboration is essential to performing an effective smart contract audit. Here's a brief overview of Vital Block auditing process and methodology:

CONNECT

- The onboarding team gathers source codes, and specifications to make sure we understand the size, and scope of the smart contract audit.

AUDIT

- Automated analysis is performed to identify common contract vulnerabilities. We may use the following third-party frameworks and dependencies to perform the automated analysis:
 - Remix IDE Developer Tool
 - Open Zeppelin Code Analyzer
 - SWC Vulnerabilities Registry
 - Visual Studio Code
 - DEX Dependencies, e.g., Pancakeswap, Liquidswap
- Simulations are performed to identify centralized exploits causing contract and/or trade locks.
- A manual line-by-line analysis is performed to identify contract issues and centralized privileges.

We may inspect below mentioned common contract vulnerabilities, and centralized exploits:

Centralized Exploits	<ul style="list-style-type: none">○ Token Supply Manipulation○ Access Control and Authorization○ Assets Manipulation○ Ownership Control○ Liquidity Access○ Stop and Pause Trading○ Ownable Library Verification
----------------------	---

Common Contract Vulnerabilities

- **Integer Overflow**
- **Lack of Arbitrary limits**
- **Incorrect Inheritance Order**
- **Typographical Errors**
- **Requirement Violation**
- **Gas Optimization**
- **Coding Style Violations**
- **Re-entrancy**
- **Third-Party Dependencies**
- **Potential Sandwich Attacks**
- **Irrelevant Codes**
- **Divide before multiply**
- **Conformance to Solidity Naming Guides**
- **Compiler Specific Warnings**
- **Language Specific Warnings**

REPORT

- **The auditing team provides a preliminary report specifying all the checks which have been performed and the findings thereof.**
- **The client's development team reviews the report and makes amendments to the codes.**
- **The auditing team provides the final comprehensive report with open and unresolved issues.**

PUBLISH






- **The client may use the audit report internally or disclose its publicly.**

 **It is important to note that there is no pass or fail in the audit, it is recommended to view the audit as an unbiased assessment of the safety of solidity codes.**



RISK CATEGORIES

Smart contracts are generally designed to hold, approve, and transfer tokens. This makes them very tempting attack targets. A successful external attack may allow the external attacker to directly exploit. A successful centralization-related exploit may allow the privileged role to directly exploit. All risks which are identified in the audit report are categorized here for the reader to review:

Risk Type	Definition
Critical ! 	These risks could be exploited easily and can lead to asset loss, data loss, asset, or data manipulation. They should be fixed right away.
Major " 	These risks are hard to exploit but very important to fix, they carry an elevated risk of smart contract manipulation, which can lead to high-risk severity.
Medium # 	These risks should be fixed, as they carry an inherent risk of future exploits, and hacks which may or may not impact the smart contract execution. Low-risk re-entrancy-related vulnerabilities should be fixed to deter exploits.
Minor \$ 	These risks do not pose a considerable risk to the contract or those who interact with it. They are code-style violations and deviations from standard practices. They should be highlighted and fixed nonetheless.
Unknown % 	These risks pose uncertain severity to the contract or those who interact with it. They should be fixed immediately to mitigate the risk uncertainty.

All statuses which are identified in the audit report are categorized here for the reader to review:

Status Type	Definition
Open	Risks are open.
Acknowledged	Risks are acknowledged, but not fixed.
Resolved	Risks are acknowledged and fixed.



CENTRALIZED PRIVILEGES

Centralization risk is the most common cause of cryptography asset loss. When a smart contract has a privileged role, the risk related to centralization is elevated.

There are some well-intended reasons have privileged roles, such as:

- **Privileged roles can be granted the power to `pause()` the contract in case of an external attack.**
- **Privileged roles can use functions like, `include()`, and `exclude()` to add or remove wallets from fees, swap checks, and transaction limits. This is useful to run a presale and to list on an exchange.**

Authorizing privileged roles to externally-owned-account (EOA) is dangerous. Lately, centralization-related losses are increasing in frequency and magnitude.

- **The client can lower centralization-related risks by implementing below mentioned practices:**
- **Privileged role's private key must be carefully secured to avoid any potential hack.**
- **Privileged role should be shared by multi-signature (multi-sig) wallets.**
- **Authorized privilege can be locked in a contract, user voting, or community DAO can be introduced to unlock the privilege.**
- **Renouncing the contract ownership, and privileged roles.**
- **Remove functions with elevated centralization risk.**

 **Understand the project's initial asset distribution. Assets in the liquidity pair should be locked. Assets outside the liquidity pair should be locked with a release schedule.**



AUTOMATED ANALYSIS

Symbol	Definition
	Function modifies state
	Function is payable
	Function is internal
	Function is private
	Function is important

```

| **APSOCOIN** | Interface | ||| |
|  | totalSupply | External |  |  |NO|
|  | decimals | External |  |  |NO|
|  | symbol | External |  |  |NO|
|  | name | External |  |  |NO|
|  | getOwner | External |  |  |NO|
|  | minting | External |  |  |NO|
|  | Burning Capabilities | External |  |NO|
|  | allowance | External |  |  |NO|
|  | approve | External |  |  |NO|
|  | transferFrom | External |  |  |NO|
|||||
| **IFactoryV2** | Interface | |||
|  | getPair | External |  |  |NO|
|  | createPair | External |  |  |NO|
|||||
| **IV2Pair** | Interface | |||
|  | factory | External |  |  |NO|
|  | getReserves | External |  |  |NO|
|  | Freezing Capabilities | External |  |  |NO|
|

```



|||||

```

| **IRouter01** | Interface |   ||| |
|  ↳ | factory | External  | |   !   |NO! |
|  ↳ | APT | External  | |   !   |NO! |
|  ↳ | addLiquidityAPT | External  | |   !   #s |NO! |
|  ↳ | addLiquidity | External  | | "   !   🚫 |NO! |
|  ↳ | swapExactAPTForTokens | External  | |   !   #s |NO! |
|  ↳ | getAmountsOut | External  | |   !   |NO! |
|  ↳ | getAmountsIn | External  | |   !   |NO! |

```

|||||

```

| **IRouter02** | Interface | IRouter01 ||| |
|  ↳ | swapExactTokensForAPTSupportingFeeOnTransferTokens | External  | | "   !   🚫 |NO! |
|  ↳ | swapExactAPTForTokensSupportingFeeOnTransferTokens | External  | |   !   #s |NO! |
|  ↳ | swapExactTokensForTokensSupportingFeeOnTransferTokens | External  | | "   !   🚫 |NO! |
|  ↳ | swapExactTokensForTokens | External  | | "   !   🚫 |NO! |

```

|||||

```

| **Protections** | Interface |   ||| |
|  ↳ | checkUser | External  | | "   !   🚫 |NO! |
|    ↳ | setLaunch | External  | |   !   🚫 |NO! |
|  ↳ | setLpPair | External  | |   !   🚫 |NO! |
|  ↳ | APT | External  | | "   !   🚫 |NO! |
|  ↳ | removeSniper | External  | | "   !   🚫 |NO! |

```

|||||

```

| **Cashier** | Interface |   ||| |
|  ↳ | setRewardsProperties | External  | | "   !   🚫 |NO! |
|  ↳ | tally | External  | | "   !   🚫 |NO! |
|  ↳ | load | External  | |   !   #s |NO! |
|  ↳ | cashout | External  | | "   !   🚫 |NO! |
|  ↳ | giveMeWelfarePlease | External  | | "   !   🚫 |NO! |
|  ↳ | getTotalDistributed | External  | |   !   |NO! |
|  ↳ | getUserInfo | External  | |   !   |NO! |
|  ↳ | getUserRealizedRewards | External  | |   !   |NO! |

```

```

|  | getPendingRewards | External | | ! | |NO!|
|  | initialize | External | | " ! |NO!|
|  | getCurrentReward | External | | ! | |NO!|
|||||
| **MOVE** | Implementation | toml |||
|  | <Constructor> | Public | | ! |NO!|
|  | transferOwner | External | | " ! | onlyOwner |
|  | renounceOwnership | External | | " ! |NO!|
|  | setOperator | Public | | " ! |NO!|
|  | renounceOriginalDeployer | External | | " ! |NO!|
|  | <Receive Ether> | External | | ! |NO!|
|  | totalSupply | External | | ! |NO!|
|  | decimals | External | | ! |NO!|
|  | symbol | External | | ! |NO!|
|  | name | External | | ! |NO!|
|  | getOwner | External | | ! |NO!|
|  | balanceOf | Public | | ! |NO!|
|  | allowance | External | | ! |NO!|
|  | approve | External | | " ! |NO!|
|  | _approve | Internal $ | | ! |
|  | approveContractContingency | Public | | " ! | onlyOwner |
|  | transfer | External | | " ! |NO!|
|  | transferFrom | External | | " ! |NO!|
|  | setNewRouter | External | | " ! | onlyOwner |
|  | setLpPair | External | | " ! | onlyOwner |
|  | setInitializers | External | | " ! | onlyOwner |
|  | isExcludedFromFees | External | | ! |NO!|
|  | isExcludedFromDividends | External | | ! |NO!|
|  | isExcludedFromProtection | External | | ! |NO!|
|  | setDividendExcluded | Public | | ! | onlyOwner |
|  | setExcludedFromFees | Public | | ! | onlyOwner |

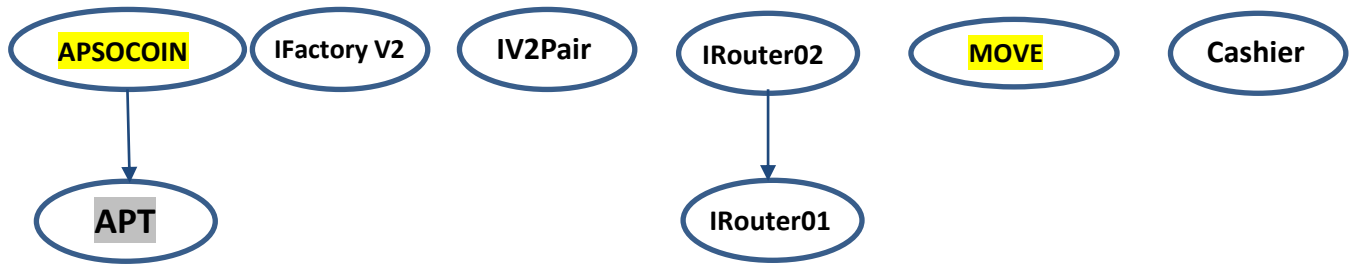
```



	⌞		getUserRealizedGains		External	⌋		!			NO	!	
	⌞		getUserUnpaidEarnings		External	⌋		!			NO	!	
	⌞		getCurrentReward		External	⌋		!			NO	!	



INHERITANCE GRAPH



Identifier	Definition	Severity
CEN-12	Centralization privileges of APSOCOIN	● Medium #

Vulnerability 0 : No important security issue detected.

Threat level: Low

```

let (burn_cap, freeze_cap, mint_cap) = coin::initialize<Apsocoin>(
  account,
  string::utf8(b"Apsocoin"),
  string::utf8(b"APSO"),
  6,
  false
);
move_to(account, CoinCapabilities {mint_cap, burn_cap, freeze_cap});
}

public entry fun mint(account: &signer, user: address, amount: u64) acquires CoinCapabilities {
  let account_addr = signer::address_of(account);

  is_admin(account_addr);
  have_coin_capabilities(account_addr);
  // check to ensure that the amount of tokens being minted does not exceed the maximum supply cap
  assert!(get_max_supply() >= ((option::destroy_some(coin::supply<Apsocoin>()) as u64) + amount), FORBIDDEN);

  let mint_cap = &borrow_global<CoinCapabilities>(account_addr).mint_cap;
  let coins = coin::mint<Apsocoin>(amount, mint_cap);
  coin::deposit<Apsocoin>(user, coins);
}

public entry fun register(account: &signer) {

```

MANUAL REVIEW

DOGLAIKACOIN: Doglaikacoin is a decentralized, peer-to-peer digital asset, on the Aptos blockchain, powered by the community. \$DLC was fair launched in November 2022, without raising any initial investments from seed investors.

TOKEN NAME: APSOCOIN

Ticker: APSO

Chain/Standard: Aptos Blockchain

Total Supply: 450,000,000,000



Outstanding features of APSOCOIN is leading the trend on the Aptos chain

The Genesis

We chose the Lhasa Apso breed as our ambassador for two reasons. First, for the alphabetical similarities with Aptos. Then, because he's a smart, loyal and fearless type of dog. These are the qualities Apso Coin wants to represent.

Just like Austin Virts, Aptos director of ecosystem, we do believe in memes as a massive fire power. And that's why we want to make Apso Coin a Meme Factory.

[Read our White Paper \(soon\)](#)



The Project

Apso Coin has the ambition to become the number one meme token on the Aptos blockchain. It would be the fastest dog token in all of crypto.

Lhasa Apso Coin also wants to unite the Aptos blockchain, and make it grow as a whole team, with all the awesome other projects.

This way, with our community and others, we will reach the stars. This project truly believe in Aptos and we are proud to work among them and to develop our already incredible community.



ISSUES CHECKING STATUS

Issue Description

Checking Status


1.	Compiler errors.	PASSED
2.	Race Conditions and reentrancy. Cross-Function Race Conditions.	PASSED
3.	Possible Delay In Data Delivery.	PASSED
4.	Oracle calls.	PASSED
5.	Front Running.	PASSED
6.	Move Dependency.	PASSED
7.	Integer Overflow And Underflow.	PASSED
8.	DoS with Revert.	PASSED
9.	Dos With Block Gas Limit.	PASSED
10.	Methods execution permissions.	PASSED
11.	Economy Model of the contract.	PASSED
12.	The Impact Of Exchange Rate On the Move Logic.	PASSED
13.	Private use data leaks.	PASSED
14.	Malicious Event log.	PASSED
15.	Scoping and Declarations.	PASSED
16.	Uninitialized storage pointers.	PASSED
17.	Arithmetic accuracy.	PASSED
18.	Design Logic.	PASSED
19.	Cross-Function race Conditions	PASSED
20.	Save Upon Move contract Implementation and Usage.	PASSED
21.	Fallback Function Security	PASSED



AUDIT RESULT

PASSED

SMART CONTRACT AUDIT OF APSOCOIN

Identifier	Definition	Severity
CEN-02	Initial asset distribution	Minor 

All of the initially minted assets are sent to the contract deployer when deploying the contract. This can be an issue as the deployer and/or contract owner can distribute tokens without consulting the community.

struct Apsocoin has key {}

```
struct CoinCapabilities has key {  
  mint_cap: coin ::MintCapability<Apsocoin>,  
  burn_cap: coin::BurnCapability<Apsocoin>,  
  freeze_cap: coin::FreezeCapability<Apsocoin>  
}  
  
public fun is_admin(addr: address) {  
  assert! (addr == @coin, ENOT_ADMIN); // i changed @coin to @coin
```

RECOMMENDATION

Project stakeholders should be consulted during the initial asset distribution process.



RECOMMENDATION


Deployer and/or contract owner private keys are secured carefully.

Please refer to PAGE-09 **CENTRALIZED PRIVILEGES for a detailed understanding.**

ALLEVIATION

DOGELAIIKA COIN project team understands the **centralization risk. Some functions are provided privileged access to ensure a good runtime behaviour in the project**



Identifier	Definition	Severity
COD-10	Third Party Dependencies	Minor 

Smart contract is interacting with third party protocols e.g., Pancakeswap router, cashier contract, protections contract. The scope of the audit treats third party entities as black boxes and assumes their functional correctness. However, in the real world, third parties can be compromised, and exploited. Moreover, upgrades in third parties can create severe impacts, e.g., increased transactional fees, deprecation of previous routers, etc.

RECOMMENDATION

Inspect and validate third party dependencies regularly, and mitigate severe impacts whenever necessary.



DISCLAIMERS

Vital Block Security provides the easy-to-understand audit of Solidity, Move and Raw source codes (commonly known as smart contracts).

The smart contract for this particular audit was analyzed for common contract vulnerabilities, and centralization exploits. This audit report makes no statements or warranties on the security of the code. This audit report does not provide any warranty or guarantee regarding the absolute bug-free nature of the smart contract analyzed, nor do they provide any indication of the client's business, business model or legal compliance. This audit report does not extend to the compiler layer, any other areas beyond the programming language, or other programming aspects that could present security risks. Cryptographic tokens are emergent technologies, they carry high levels of technical risks and uncertainty. You agree that your access and/or use, including but not limited to any services, reports, and materials, will be at your sole risk on an as-is, where-is, and as-available basis. This audit report could include false positives, false negatives, and other unpredictable results.

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Vital Block is Dedicated to Making Defi & Web3 A Safer Place. We are Powered by Security engineers, developers, UI experts, and blockchain enthusiasts. Our team currently consists of 5 core members, and 4+ casual contributors.

Website: <https://Vitalblock.org>

Email: info@vitalblock.org

GitHub: <https://github.com/vital-block>

Telegram (Engineering): https://t.me/vital_block

Telegram (Onboarding): https://t.me/vitalblock_cmo





vital-block



info@vitalblock.org



www.Vitalblock.org



Vital Block is Dedicated to securing Public and Private Blockchain Ecosystem