Staking Contract (Shopping.io)

SMART CONTRACT AUDIT

19.01.2021

Made in Germany by Chainsulting.de

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1. Disclaimer

The audit makes no statements or warrantees about utility of the code, safety of the code, suitability of the business model, investment advice, endorsement of the platform or its products, regulatory regime for the business model, or any other statements about fitness of the contracts to purpose, or their bug free status. The audit documentation is for discussion purposes only.

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Major Versions / Date	Description
0.1 (17.01.2021)	Layout
0.5 (18.01.2021)	Automated Security Testing Manual Security Testing
0.8 (19.01.2021)	Testing SWC Checks
1.0 (19.01.2021)	Summary and Recommendation

2. About the Project and Company

Company address:

AZ EXPRESS RETAIL LLC
4281 EXPRESS LN
SARASOTA
FLORIDA, 34249
United States

Website: https://shopping.io

Instagram: https://www.instagram.com/shopping.io_official/

Twitter: https://twitter.com/shopping_io

Discord: https://discord.gg/36xNXa6

Telegram: https://t.me/shoppingio

Facebook: https://www.facebook.com/shopping.io/

2.1 Project Overview

Shopping.io was established as of December 2020. They are founded by dropshipping veterans with a vision to change how we make purchases with crypto. Shopping.io allows users to purchase goods directly from some of the leading ecommerce giants using over 100 different cryptocurrencies. To avail of this facility, all one has to do is sign up on Shopping.io by entering their email address and setting up the desired password. Once the account is created, they get access to a personal dashboard from which they can start searching and ordering stuff from the likes of Amazon, Walmart, eBay and more. The entire process from scratch takes no longer than a few minutes. Apart from the convenience of making payment in cryptocurrencies, customers on Shopping.io also stand to enjoy additional discounts and freedom from miscellaneous charges like shipping charges, sales tax, and more.

Shopping.io is in the constant process of developing and introducing new features for the cryptocurrency community. Some of the upcoming developments include the launch of its own token that offers an additional 5% discount and international shipping service to token holders. The platform will also be introducing new membership tiers after the conclusion of the limited period 10% discount offer on Free accounts. While users will still be able to purchase goods with cryptocurrencies using a free account, the discounts will be limited to Starter and Pro accounts at 5% and 10% respectively. All products shopped on Shopping.io, irrespective of account type will be eligible for 2-day free delivery within the United States along with a return/refund policy applicable for a maximum of 30 days from the date of delivery. Shopping.io will also be expanding its support for other leading ecommerce platforms including the upcoming AliExpress integration.

3. Vulnerability & Risk Level

Risk represents the probability that a certain source-threat will exploit vulnerability, and the impact of that event on the organization or system. Risk Level is computed based on CVSS version 3.0.

Level	Value	Vulnerability	Risk (Required Action)
Critical	9 – 10	A vulnerability that can disrupt the contract functioning in a number of scenarios, or creates a risk that the contract may be broken.	Immediate action to reduce risk level.
High	7 – 8.9	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.	Implementation of corrective actions as soon as possible.
Medium	4 – 6.9	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.	Implementation of corrective actions in a certain period.
Low	2 – 3.9	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.	Implementation of certain corrective actions or accepting the risk.
Informational	0 – 1.9	A vulnerability that have informational character but is not effecting any of the code.	An observation that does not determine a level of risk

4. Auditing Strategy and Techniques Applied

Throughout the review process, care was taken to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices. To do so, reviewed line-by-line by our team of expert pentesters and smart contract developers, documenting any issues as there were discovered.

4.1 Methodology

The auditing process follows a routine series of steps:

1. Code review that includes the following:
   i. Review of the specifications, sources, and instructions provided to Chainsulting to make sure we understand the size, scope, and functionality of the smart contract.
   ii. Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
   iii. Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to Chainsulting describe.
2. Testing and automated analysis that includes the following:
   i. Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
   ii. Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.
3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

4.2 Used Code from other Frameworks/Smart Contracts

1. SafeMath.sol (0.6.0)
https://github.com/OpenZeppelin/openzeppelin-contracts/blob/master/contracts/math/SafeMath.sol
2. Ownable.sol (0.6.0)
https://github.com/OpenZeppelin/openzeppelin-contracts/blob/master/contracts/access/Ownable.sol

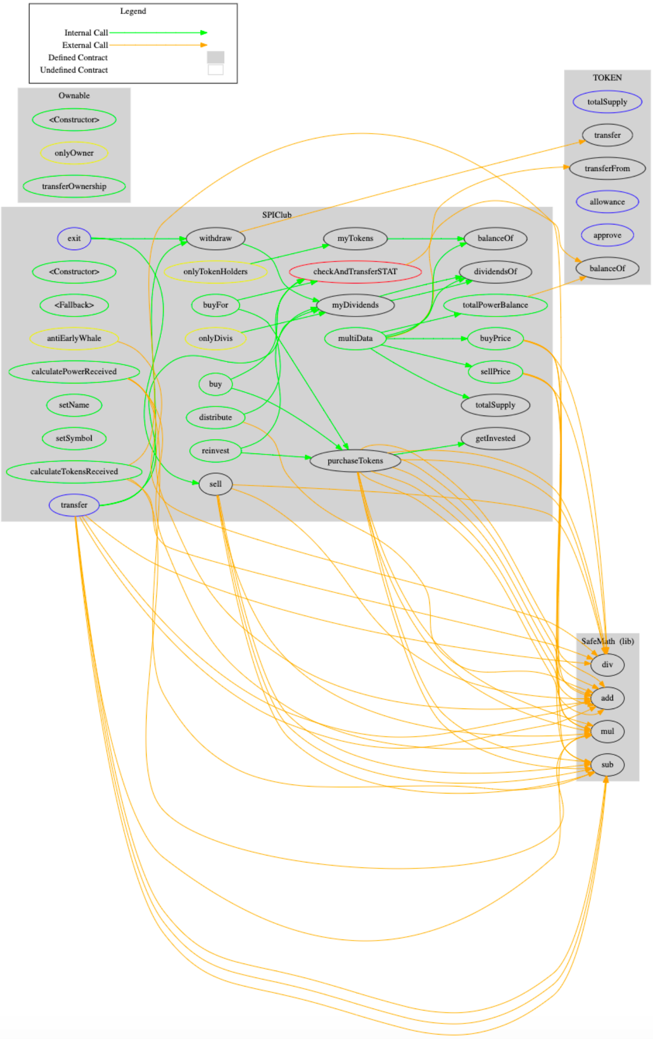
3. https://unipower.network / StaticPower Contract
https://etherscan.io/address/0xBaB61589f963534460E2764A1C0d840B745A9140#code

4.3 Tested Contract Files

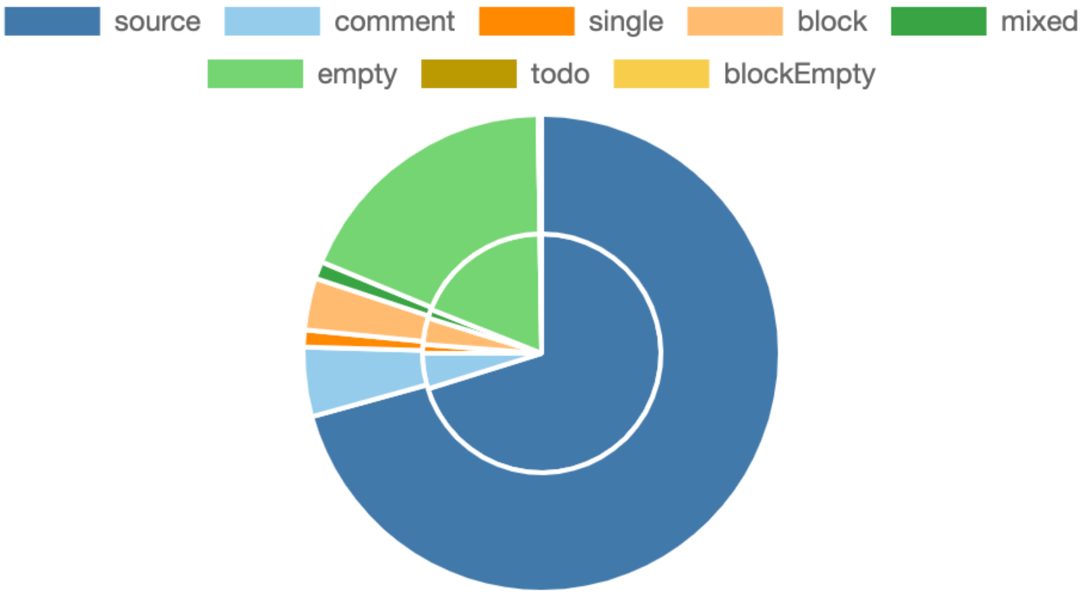
The following are the SHA-256 hashes of the reviewed files. A file with a different SHA-256 hash has been modified, intentionally or otherwise, after the security review. You are cautioned that a different SHA-256 hash could be (but is not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of the review

File	Fingerprint (SHA256)
spi_staking.sol	D4D9C33E25DE0FCEFFC3F181173A6A2CED9A719F95F1C3C043FE357829A05C87

4.4 Metrics / CallGraph



4.5 Metrics / Source Lines



4.6 Metrics / Capabilities

Solidity Versions observed	🧪 Experimental Features	💰 Can Receive Funds	🖥 Uses Assembly	💣 Has Destroyable Contracts
`^0.4.26`		`yes`	**** (0 asm blocks)	

📤 Transfers ETH	⚡ Low-Level Calls	👥 DelegateCall	🧮 Uses Hash Functions	🔖 ECRecover	🌀 New/Create/Create2
`yes`					

4.7 Metrics / Source Unites in Scope

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
📝📚	spi_staking.sol	4		395	384	292	20	221	💰📤☀️
📝📚	**Totals**	**4**		**395**	**384**	**292**	**20**	**221**	💰📤☀️

5. Scope of Work

The Shopping.io team provided us with the files that needs to be tested. The scope of the audit is the SPI Staking contract. (SPI Club)

Verify claims:

1. Developer can’t steal any user funds
2. Developer cannot burn or lock user funds
3. Developer cannot pause the contract

5.1 Manual and Automated Vulnerability Test

CRITICAL ISSUES

During the audit, Chainsulting‘s experts found **no Critical issues** in the code of the smart contract.

HIGH ISSUES

During the audit, Chainsulting’s experts found **no High issues** in the code of the smart contract.

MEDIUM ISSUES

During the audit, Chainsulting’s experts found **no Medium issues** in the code of the smart contract.

LOW ISSUES

During the audit, Chainsulting’s experts found **no Low issues** in the code of the smart contract.

INFORMATIONAL ISSUES

5.1.1 Unusual symbol extension

Severity: INFORMATIONAL
Status: Acknowledged
File(s) affected: spi_staking.sol

Attack / Description	Code Snippet	Result/Recommendation

Symbol extension is not consistently used. Fixing these mistakes can help improve the end-user experience by providing clear and consistent symbol extensions.	`Line: XX`
	`*STAT`
	`function checkAndTransferSTAT …`
	
	`invested_[msg.sender] += _incomingSTAT;…`
		Consider using SPIC instead of STAT for function or variable names, as a not consistently used symbol extension may confuse the reader.

5.2. SWC Attacks & Special Checks

ID	Title	Relationships	Test Result
SWC-131	Presence of unused variables	CWE-1164: Irrelevant Code	☑
SWC-130	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	☑
SWC-129	Typographical Error	CWE-480: Use of Incorrect Operator	☑
SWC-128	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	☑
SWC-127	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	☑
SWC-125	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	☑
SWC-124	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	☑
SWC-123	Requirement Violation	CWE-573: Improper Following of Specification by Caller	☑

ID	Title	Relationships	Test Result
SWC-122	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	✅
SWC-121	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	✅
SWC-120	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	✅
SWC-119	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	✅
SWC-118	Incorrect Constructor Name	CWE-665: Improper Initialization	✅
SWC-117	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	✅
SWC-116	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	✅
SWC-115	Authorization through tx.origin	CWE-477: Use of Obsolete Function	✅
SWC-114	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	✅

ID	Title	Relationships	Test Result
SWC-113	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	✅
SWC-112	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	✅
SWC-111	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	✅
SWC-110	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	✅
SWC-109	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	✅
SWC-108	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	✅
SWC-107	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	✅
SWC-106	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	✅
SWC-105	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	✅
SWC-104	Unchecked Call Return Value	CWE-252: Unchecked Return Value	✅

ID	Title	Relationships	Test Result
SWC-103	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	✅
SWC-102	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	✅
SWC-101	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	✅
SWC-100	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	✅
1	Developer (Deployer) cannot burn or lock user funds	We deployed the contract in our test network and tried the withdrawal. Result: it was possible	✅
2	Developer (Deployer) is not able to withdraw/ steal staked tokens	We deployed the contract in our test network and tried to steal staked token funds with the deployer address. Result: it was not possible	✅
3	Developer (Deployer) cannot pause the contract	We deployed the contract in our test network and tried to pause the contract. There is no function to pause it. Result: it was not possible	✅

6. Executive Summary

Two (2) independent Chainsulting experts performed an unbiased and isolated audit of the smart contract codebase. The final debrief took place on the January 19, 2021. The overall code quality of the project is very good, not overloaded with unnecessary functions, these is greatly benefiting the security of the contract. It correctly implemented widely-used and reviewed contracts from OpenZeppelin and for safe mathematical operations.

The main goal of the audit was to verify the claims regarding the security of the smart contract and the claims inside the scope of work. During the audit, no issues were found after the manual and automated security testing.

7. Deployed Smart Contract

VERIFIED

SPI Staking Contract (SPIC)
0xc15122898c3eE73211d8a8a4a656Ba1980D53086