Cyberscope

Audit Report

SWPR

March 2024

Analysis

● Critical   ● Medium   ● Minor / Informative   ● Pass

Severity	Code	Description	Status
●	ST	Stops Transactions	Unresolved
●	OTUT	Transfers User's Tokens	Passed
●	ELFM	Exceeds Fees Limit	Passed
●	MT	Mints Tokens	Passed
●	BT	Burns Tokens	Passed
●	BC	Blacklists Addresses	Passed

Diagnostics

🔴 Critical   🟠 Medium   ⚫ Minor / Informative

Severity	Code	Description	Status
⚫	IDI	Immutable Declaration Improvement	Unresolved
⚫	MEE	Missing Events Emission	Unresolved
⚫	PLPI	Potential Liquidity Provision Inadequacy	Unresolved
⚫	RED	Redudant Event Declaration	Unresolved
⚫	RLF	Redundant Liquidity Functionality	Unresolved
⚫	RSML	Redundant SafeMath Library	Unresolved
⚫	L04	Conformance to Solidity Naming Conventions	Unresolved
⚫	L09	Dead Code Elimination	Unresolved
⚫	L13	Divide before Multiply Operation	Unresolved
⚫	L15	Local Scope Variable Shadowing	Unresolved

Table of Contents

Review

Contract Name	SWPR
Compiler Version	v0.8.20+commit.a1b79de6
Optimization	200 runs
Explorer	https://etherscan.io/address/0x0abbbfbf0f462bb3cb711a50d415a2dd4c382007
Address	0x0abbbfbf0f462bb3cb711a50d415a2dd4c382007
Network	ETH
Symbol	SWPR
Decimals	18
Total Supply	1,000,000
Badge Eligibility	Yes

Audit Updates

Initial Audit	25 Mar 2024

Source Files

Filename	SHA256
SWPR.sol	7103c737a2aac4497d4392aa1c29e5611c7aed92c1d5c2dbdc88a2ac09469b0b

Findings Breakdown

	Severity	Unresolved	Acknowledged	Resolved	Other
🔴	Critical	1	0	0	0
🟡	Medium	0	0	0	0
⚪	Minor / Informative	10	0	0	0
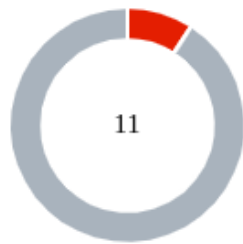
Critical 1
Medium 0
Minor / Informative 10

ST - Stops Transactions

Criticality	Critical
Location	SWPR.sol#L1165
Status	Unresolved

Description

The transactions are initially disabled for all users excluding the authorized addresses. The owner can enable the transactions for all users. Once the transactions are enable the owner will not be able to disable them again.

```solidity
if (!tradingActive) {
  require(
    _isExcludedFromFees[from] || _isExcludedFromFees[to],
    "Trading is not active."
  );
}
```

Recommendation

The team should carefully manage the private keys of the owner's account. We strongly recommend a powerful security mechanism that will prevent a single user from accessing the contract admin functions. Some suggestions are:

- Introduce a multi-sign wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.

IDI - Immutable Declaration Improvement

Criticality	Minor / Informative
Location	SWPR.sol#L1103,1104,1107,1108,1109,1111,1112,1113
Status	Unresolved

Description

The contract declares state variables that their value is initialized once in the constructor and are not modified afterwards. The `immutable` is a special declaration for this kind of state variables that saves gas when it is defined.

```
maxTransactionAmount
maxWallet
buyShareFee
buyLiquidityFee
buyTotalFees
sellShareFee
sellLiquidityFee
sellTotalFees
```

Recommendation

By declaring a variable as immutable, the Solidity compiler is able to make certain optimizations. This can reduce the amount of storage and computation required by the contract, and make it more gas-efficient.

MEE - Missing Events Emission

Criticality	Minor / Informative
Location	SWPR.sol#L1106,1111,1123
Status	Unresolved

Description

The contract performs actions and state mutations from external methods that do not result in the emission of events. Emitting events for significant actions is important as it allows external parties, such as wallets or dApps, to track and monitor the activity on the contract. Without these events, it may be difficult for external parties to accurately determine the current state of the contract.

```
function launchTrading() external onlyOwner {...}
...
function excludeFromMaxTransaction(
address updAds,
bool isEx
) public onlyOwner {...}
```

Recommendation

It is recommended to include events in the code that are triggered each time a significant action is taking place within the contract. These events should include relevant details such as the user's address and the nature of the action taken. By doing so, the contract will be more transparent and easily auditable by external parties. It will also help prevent potential issues or disputes that may arise in the future.

PLPI - Potential Liquidity Provision Inadequacy

Criticality	Minor / Informative
Location	SWPR.sol#L1239
Status	Unresolved

Description

The contract operates under the assumption that liquidity is consistently provided to the pair between the contract's token and the native currency. However, there is a possibility that liquidity is provided to a different pair. This inadequacy in liquidity provision in the main pair could expose the contract to risks. Specifically, during eligible transactions, where the contract attempts to swap tokens with the main pair, a failure may occur if liquidity has been added to a pair other than the primary one. Consequently, transactions triggering the swap functionality will result in a revert.

```solidity
function swapTokensForEth(uint256 tokenAmount) private {
    address[] memory path = new address[](2);
    path[0] = address(this);
    path[1] = uniswapV2Router.WETH();

    _approve(address(this), address(uniswapV2Router), tokenAmount);

    uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(
        tokenAmount,
        0,
        path,
        address(this),
        block.timestamp
    );
}
```

Recommendation

The team is advised to implement a runtime mechanism to check if the pair has adequate liquidity provisions. This feature allows the contract to omit token swaps if the pair does not have adequate liquidity provisions, significantly minimizing the risk of potential failures.

Furthermore, the team could ensure the contract has the capability to switch its active pair in case liquidity is added to another pair.

Additionally, the contract could be designed to tolerate potential reverts from the swap functionality, especially when it is a part of the main transfer flow. This can be achieved by executing the contract's token swaps in a non-reversible manner, thereby ensuring a more resilient and predictable operation.

RED - Redudant Event Declaration

Criticality	Minor / Informative
Location	SWPR.sol#L1067
Status	Unresolved

Description

The contract uses events that are not emitted within the contract's functions. As a result, these declared events are redundant and serve no purpose within the contract's current implementation.

```
event UpdateUniswapV2Router(
    address indexed newAddress,
    address indexed oldAddress
);
```

Recommendation

To optimize contract performance and efficiency, it is advisable to regularly review and refactor the codebase, removing the unused event declarations. This proactive approach not only streamlines the contract, reducing deployment and execution costs but also enhances readability and maintainability.

RLF - Redundant Liquidity Functionality

Criticality	Minor / Informative
Location	SWPR.sol#L1068
Status	Unresolved

Description

The contract contains two different fees the share fee that is transferred to a wallet address and the liquidity fee that adds liquidity to the pair address. The liquidity fee is set to zero and cannot be changed. As a result, the entire liquidity provision feature in the contract is redundant.

```
uint256 _buyShareFee = 3;
uint256 _buyLiquidityFee = 0;

uint256 _sellShareFee = 3;
uint256 _sellLiquidityFee = 0;
```

Recommendation

The team is advised to remove the liquidity provision feature since it is not used by the contract. It unnecessarily increases the code complexity and gas consumption.

RSML - Redundant SafeMath Library

Criticality	Minor / Informative
Location	SWPR.sol
Status	Unresolved

Description

SafeMath is a popular Solidity library that provides a set of functions for performing common arithmetic operations in a way that is resistant to integer overflows and underflows.

Starting with Solidity versions that are greater than or equal to 0.8.0, the arithmetic operations revert to underflow and overflow. As a result, the native functionality of the Solidity operations replaces the SafeMath library. Hence, the usage of the SafeMath library adds complexity, overhead and increases gas consumption unnecessarily in cases where the explanatory error message is not used.

```
library SafeMath {...}
```

Recommendation

The team is advised to remove the SafeMath library in cases where the revert error message is not used. Since the version of the contract is greater than `0.8.0` then the pure Solidity arithmetic operations produce the same result.

If the previous functionality is required, then the contract could exploit the `unchecked { ... }` statement.

Read more about the breaking change on https://docs.soliditylang.org/en/v0.8.16/080-breaking-changes.html#solidity-v0-8-0-breaking-changes.

L04 - Conformance to Solidity Naming Conventions

Criticality	Minor / Informative
Location	SWPR.sol#L913,915,946,988,1063
Status	Unresolved

Description

The Solidity style guide is a set of guidelines for writing clean and consistent Solidity code. Adhering to a style guide can help improve the readability and maintainability of the Solidity code, making it easier for others to understand and work with.

The followings are a few key points from the Solidity style guide:

1. Use camelCase for function and variable names, with the first letter in lowercase (e.g., myVariable, updateCounter).
2. Use PascalCase for contract, struct, and enum names, with the first letter in uppercase (e.g., MyContract, UserStruct, ErrorEnum).
3. Use uppercase for constant variables and enums (e.g., MAX_VALUE, ERROR_CODE).
4. Use indentation to improve readability and structure.
5. Use spaces between operators and after commas.
6. Use comments to explain the purpose and behavior of the code.
7. Keep lines short (around 120 characters) to improve readability.

```
function DOMAIN_SEPARATOR() external view returns (bytes32);
function PERMIT_TYPEHASH() external pure returns (bytes32);
function MINIMUM_LIQUIDITY() external pure returns (uint256);
function WETH() external pure returns (address);
mapping(address => bool) public _isExcludedMaxTransactionAmount
```

Recommendation

By following the Solidity naming convention guidelines, the codebase increased the readability, maintainability, and makes it easier to work with.

Find more information on the Solidity documentation

https://docs.soliditylang.org/en/v0.8.17/style-guide.html#naming-convention.

L09 - Dead Code Elimination

Criticality	Minor / Informative
Location	SWPR.sol#L528
Status	Unresolved

Description

In Solidity, dead code is code that is written in the contract, but is never executed or reached during normal contract execution. Dead code can occur for a variety of reasons, such as:

- Conditional statements that are always false.
- Functions that are never called.
- Unreachable code (e.g., code that follows a return statement).

Dead code can make a contract more difficult to understand and maintain, and can also increase the size of the contract and the cost of deploying and interacting with it.

```
function _burn(address account, uint256 amount) internal virtual {
        require(account != address(0), "ERC20: burn from the zero
address");

        _beforeTokenTransfer(account, address(0), amount);

        uint256 accountBalance = _balances[account];
...
        }
        _totalSupply -= amount;

        emit Transfer(account, address(0), amount);

        _afterTokenTransfer(account, address(0), amount);
    }
```

Recommendation

To avoid creating dead code, it's important to carefully consider the logic and flow of the contract and to remove any code that is not needed or that is never executed. This can help improve the clarity and efficiency of the contract.

L13 - Divide before Multiply Operation

Criticality	Minor / Informative
Location	SWPR.sol#L1259,1260,1263,1264,1265
Status	Unresolved

Description

It is important to be aware of the order of operations when performing arithmetic calculations. This is especially important when working with large numbers, as the order of operations can affect the final result of the calculation. Performing divisions before multiplications may cause loss of prediction.

```
tokensForDistro += (fees * sellShareFee) / sellTotalFees
fees = (amount * buyTotalFees) / 100
```

Recommendation

To avoid this issue, it is recommended to carefully consider the order of operations when performing arithmetic calculations in Solidity. It's generally a good idea to use parentheses to specify the order of operations. The basic rule is that the multiplications should be prior to the divisions.

L15 - Local Scope Variable Shadowing

Criticality	Minor / Informative
Location	SWPR.sol#L1101
Status	Unresolved

Description

Local scope variable shadowing occurs when a local variable with the same name as a variable in an outer scope is declared within a function or code block. When this happens, the local variable "shadows" the outer variable, meaning that it takes precedence over the outer variable within the scope in which it is declared.

```
uint256 totalSupply = 1_000_000 * 1e18
```

Recommendation

It's important to be aware of shadowing when working with local variables, as it can lead to confusion and unintended consequences if not used correctly. It's generally a good idea to choose unique names for local variables to avoid shadowing outer variables and causing confusion.

Functions Analysis

Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
SWPR	Implementation	ERC20, Ownable		
		Public	✓	ERC20
		External	Payable	-
	launchTrading	External	✓	onlyOwner
	excludeFromMaxTransaction	Public	✓	onlyOwner
	excludeFromFees	Public	✓	onlyOwner
	setAutomatedMarketMakerPair	Public	✓	onlyOwner
	_setAutomatedMarketMakerPair	Private	✓	
	isExcludedFromFees	Public		-
	_transfer	Internal	✓	
	swapTokensForEth	Private	✓	
	addLiquidity	Private	✓	
	swapBack	Private	✓	

Inheritance Graph
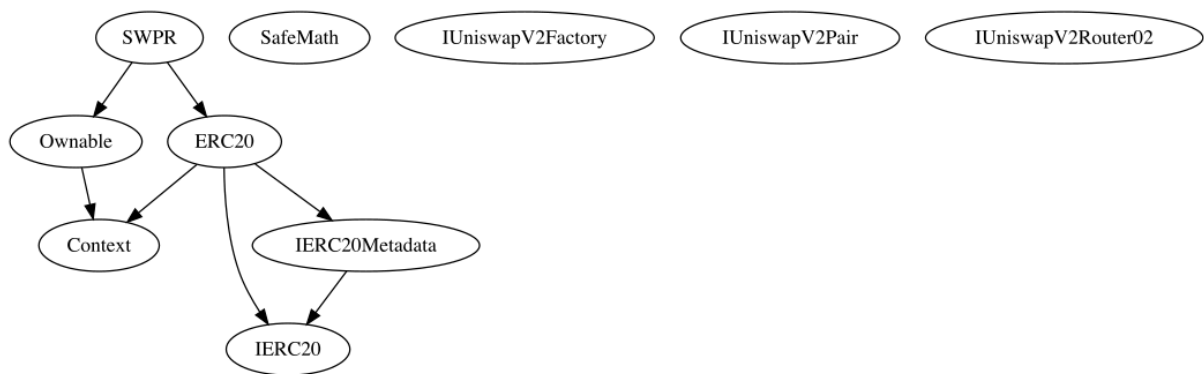
Flow Graph
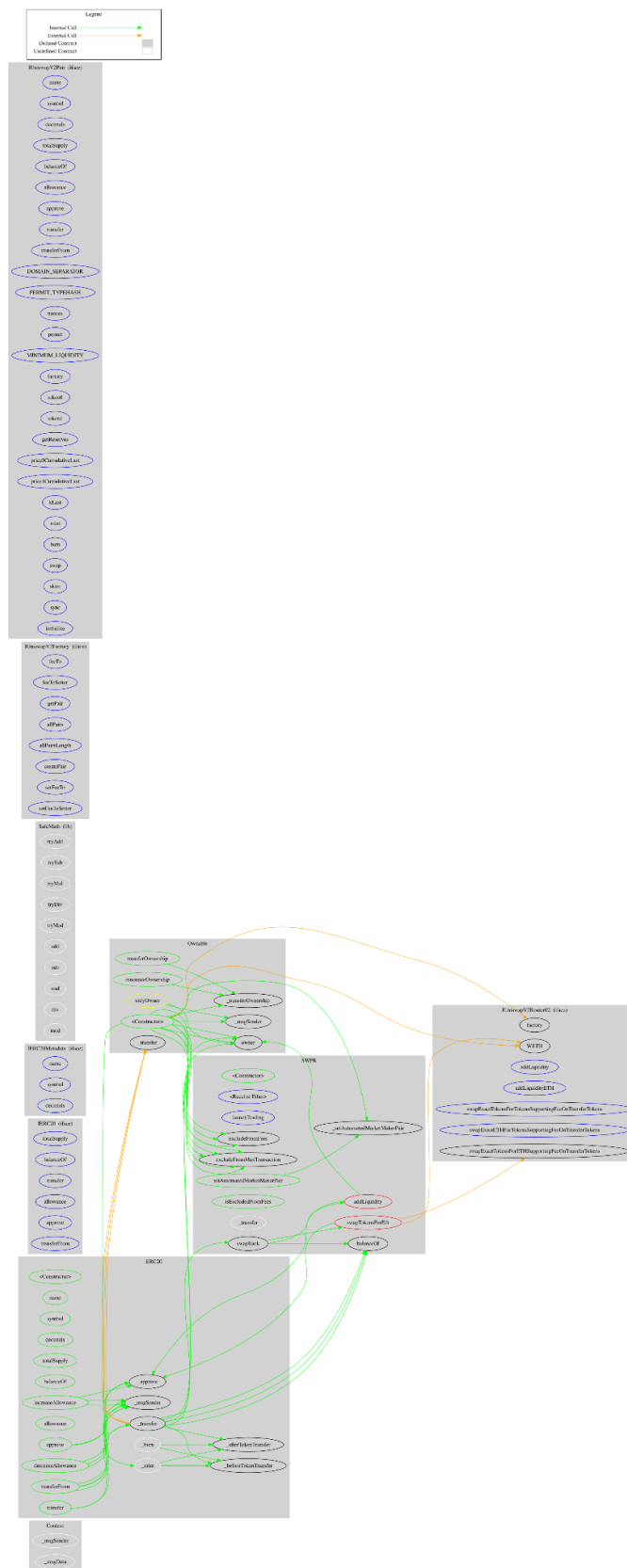
Summary

SWPR Finance contract implements a token mechanism. This audit investigates security issues, business logic concerns and potential improvements. There are some functions that can be abused by the owner like stop transactions. A multi-wallet signing pattern will provide security against potential hacks. The contract contains a redundant liquidity provision feature that cannot be used. The fees are fixed at 3%.

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The Cyberscope team

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