

ArenaPlay
Smart Contract
Audit Report





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AUDITED DETAILS

Audited Project

| Project name | Token ticker | Blockchain | |
|--------------|--------------|---------------------|--|
| ArenaPlay | APC | Binance Smart Chain | |

Addresses

| Contract address | 0x2aa504586d6cab3c59fa629f74c586d78b93a025 |
|---------------------------|--|
| Contract deployer address | 0x4e6b2534e1c030E2A849C1BD6409de609bdcf81F |

Project Website

https://twitter.com/ArenaPlayAPC

Codebase

https://bscscan.com/address/0x2aa504586d6cab3c59fa629f74c586d78b93a025#code



SUMMARY

ArenaPlay is a decentralized Sports, esports & crypto betting platform. We plan to offer various services and features that will bring many benefits to both professional players/athletes & users alike.

Contract Summary

Documentation Quality

ArenaPlay 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 ArenaPlay with the discovery of several low issues.

Test Coverage

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

Audit Findings Summary

- SWC-100 SWC-108 | Explicitly define visibility for all state variables on lines 439.
- SWC-101 | It is recommended to use vetted safe math libraries for arithmetic operations consistently on lines 33, 47, 57, 58, 70, 82, 276, 277, 284, 410, 410, 425, 425, 553, 589, 589, 590, 590, 591, 591, 592, 592, 599, 615, 620, 661, 667, 276 and 277.
- SWC-103 | Pragma statements can be allowed to float when a contract is intended on lines 7.
- SWC-110 SWC-123 | It is recommended to use of revert(), assert(), and require() in Solidity, and the new REVERT opcode in the EVM on lines 280, 282, 309, 554, 706 and 707.



CONCLUSION

We have audited the ArenaPlay project released on July 2022 to discover issues and identify potential security vulnerabilities in ArenaPlay 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 ArenaPlay smart contract code issues 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, a floating pragma is set, a state variable visibility is not set, and out-of-bounds array access which the index access expression can cause an exception in case of the use of an invalid array index value. It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code. It is best practice to set the visibility of state variables explicitly. The default visibility for "inSwapAndLiquify" is internal. Other possible visibility settings are public and private.



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. | ISSUF | |
| 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. | ISSUE FOUND | |
| 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. | it 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 ISSU failing assert statement. FOUL | | |
| Deprecated Solidity Functions | SWC-111 | Deprecated built-in functions should never be used. | e 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. | |
|--|--|---|------|
| Race Conditions | SWC-114 | Race Conditions and Transactions Order Dependency should not be possible. | |
| Authorization through tx.origin | SWC-115 | tx.origin should not be used for authorization. | |
| Block values as a proxy for time | SWC-116 | Block numbers should not be used for time calculations. | |
| 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 | SWC-119 State variables should not be shadowed. | |
| Weak Sources of Randomness | SWC-120 | Random values should never be generated from Chain Attributes or be predictable. | |
| 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 | | 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. | |
| 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. | |
|-------------------------------|--------------------|--|------|
| 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. | |
| 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. | |
| Hash Collisions Variable | SWC-133 | Using abi.encodePacked() with multiple variable length arguments can, in certain situations, lead to a hash collision. | |
| Hardcoded gas amount | SWC-134 | The transfer() and send() functions forward a fixed amount of 2300 gas. | |
| Unencrypted Private Data | SWC-136 | It is a common misconception that private type variables cannot be read. | PASS |



SMART CONTRACT ANALYSIS

| Started | Sunday Jul 03 2022 18:11:04 GMT+0000 (Coordinated Universal Time) | | |
|------------------|---|--|--|
| Finished | Monday Jul 04 2022 16:17:35 GMT+0000 (Coordinated Universal Time) | | |
| Mode | Standard | | |
| Main Source File | APCToken.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 | 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 | COMPILER-REWRITABLE " <uint> - 1" DISCOVERED</uint> | low | acknowledged |
| SWC-101 | COMPILER-REWRITABLE " <uint> - 1" DISCOVERED</uint> | low | acknowledged |
| SWC-103 | A FLOATING PRAGMA IS SET. | low | acknowledged |
| SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET. | low | acknowledged |
| SWC-110 | OUT OF BOUNDS ARRAY ACCESS | low | acknowledged |
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| SWC-110 | OUT OF BOUNDS ARRAY ACCESS | low | acknowledged |



LINE 33

low SEVERITY

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

Source File

- APCToken.sol

```
function add(uint256 a, uint256 b) internal pure returns (uint256) {
   uint256 c = a + b;
   require(c >= a, "SafeMath: addition overflow");
   return c;
}
```



LINE 47

low SEVERITY

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

Source File

- APCToken.sol

```
46  require(b <= a, errorMessage);
47  uint256 c = a - b;
48
49  return c;
50  }
51</pre>
```



LINE 57

low SEVERITY

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

Source File

- APCToken.sol

```
56  }
57  uint256 c = a * b;
58  require(c / a == b, "SafeMath: multiplication overflow");
59  return c;
60  }
61
```



LINE 58

low SEVERITY

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

Source File

- APCToken.sol

```
57  uint256 c = a * b;
58  require(c / a == b, "SafeMath: multiplication overflow");
59  return c;
60  }
61
62
```



LINE 70

low SEVERITY

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

Source File

- APCToken.sol

```
69    require(b > 0, errorMessage);
70    uint256 c = a / b;
71    return c;
72    }
73
74
```



LINE 82

low SEVERITY

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

Source File

- APCToken.sol

```
81 require(b != 0, errorMessage);
82 return a % b;
83 }
84 }
85
86
```



LINE 276

low SEVERITY

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

Source File

- APCToken.sol

```
275
276 uint256 toDeleteIndex = valueIndex - 1;
277 uint256 lastIndex = set._values.length - 1;
278
279
280
```



LINE 277

low SEVERITY

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

Source File

- APCToken.sol

```
276   uint256 toDeleteIndex = valueIndex - 1;
277   uint256 lastIndex = set._values.length - 1;
278
279
280   bytes32 lastvalue = set._values[lastIndex];
281
```



LINE 284

low SEVERITY

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

Source File

- APCToken.sol

```
// Update the index for the moved value
set._indexes[lastvalue] = toDeleteIndex + 1; // All indexes are 1-based
set._values.pop();
set._values.pop();
287
288
```



LINE 410

low SEVERITY

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

Source File

- APCToken.sol

```
409    constructor (address token) public{
410        IERC20(token).approve(msg.sender,10 ** 12 * 10**18);
411     }
412    }
413
414
```



LINE 410

low SEVERITY

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

Source File

- APCToken.sol

```
409    constructor (address token) public{
410        IERC20(token).approve(msg.sender,10 ** 12 * 10**18);
411     }
412    }
413
414
```



LINE 410

low SEVERITY

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

Source File

- APCToken.sol

```
409    constructor (address token) public{
410        IERC20(token).approve(msg.sender,10 ** 12 * 10**18);
411     }
412    }
413
414
```



LINE 425

low SEVERITY

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

Source File

- APCToken.sol

```
424  uint8 private _decimals = 18;
425  uint256 private _tTotal = 1000000000 * 10 ** 18;
426
427  string private _name = "ArenaPlay";
428  string private _symbol = "APC";
429
```



LINE 425

low SEVERITY

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

Source File

- APCToken.sol

```
424  uint8 private _decimals = 18;
425  uint256 private _tTotal = 1000000000 * 10 ** 18;
426
427  string private _name = "ArenaPlay";
428  string private _symbol = "APC";
429
```



LINE 553

low SEVERITY

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

Source File

- APCToken.sol

```
function excludeFromFee(address[] memory accounts) public onlyOwner {
for( uint i = 0; i < accounts.length; i++ ){
   _isExcludedFromFee[accounts[i]] = true;
}

555  }

556  }
</pre>
```



LINE 589

low SEVERITY

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

Source File

- APCToken.sol

```
function _initParam(uint256 tAmount,Param memory param) private view {
  param.tLQ = tAmount * _lQFee / 1000;
  param.tBurn = tAmount * _burnFee / 1000;
  param.tFund = tAmount * _fundFee / 1000;
  uint tFee = tAmount * totalFee / 1000;
```



LINE 589

low SEVERITY

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

Source File

- APCToken.sol

```
function _initParam(uint256 tAmount,Param memory param) private view {
  param.tLQ = tAmount * _lQFee / 1000;
  param.tBurn = tAmount * _burnFee / 1000;
  param.tFund = tAmount * _fundFee / 1000;
  uint tFee = tAmount * totalFee / 1000;
```



LINE 590

low SEVERITY

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

Source File

- APCToken.sol

```
param.tLQ = tAmount * _lQFee / 1000;

param.tBurn = tAmount * _burnFee / 1000;

param.tFund = tAmount * _fundFee / 1000;

uint tFee = tAmount * totalFee / 1000;

param.tTransferAmount = tAmount.sub(tFee);

594
```



LINE 590

low SEVERITY

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

Source File

- APCToken.sol

```
param.tLQ = tAmount * _lQFee / 1000;

param.tBurn = tAmount * _burnFee / 1000;

param.tFund = tAmount * _fundFee / 1000;

uint tFee = tAmount * totalFee / 1000;

param.tTransferAmount = tAmount.sub(tFee);

594
```



LINE 591

low SEVERITY

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

Source File

- APCToken.sol

```
590 param.tBurn = tAmount * _burnFee / 1000;
591 param.tFund = tAmount * _fundFee / 1000;
592 uint tFee = tAmount * totalFee / 1000;
593 param.tTransferAmount = tAmount.sub(tFee);
594 }
595
```



LINE 591

low SEVERITY

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

Source File

- APCToken.sol

```
590 param.tBurn = tAmount * _burnFee / 1000;
591 param.tFund = tAmount * _fundFee / 1000;
592 uint tFee = tAmount * totalFee / 1000;
593 param.tTransferAmount = tAmount.sub(tFee);
594 }
595
```



LINE 592

low SEVERITY

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

Source File

- APCToken.sol

```
591 param.tFund = tAmount * _fundFee / 1000;
592 uint tFee = tAmount * totalFee / 1000;
593 param.tTransferAmount = tAmount.sub(tFee);
594 }
595
596
```



LINE 592

low SEVERITY

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

Source File

- APCToken.sol

```
591 param.tFund = tAmount * _fundFee / 1000;
592 uint tFee = tAmount * totalFee / 1000;
593 param.tTransferAmount = tAmount.sub(tFee);
594 }
595
596
```



LINE 599

low SEVERITY

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

Source File

- APCToken.sol

```
598  _take(param.tLQ, from, address(this));
599  lQAmount += param.tLQ;
600  }
601  if( param.tBurn > 0 ){
602  _take(param.tBurn, from, address(0));
603
```



LINE 615

low SEVERITY

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

Source File

- APCToken.sol

```
614  if( token0 != address(this) && bal0 > r0 ){
615   isAdd = bal0 - r0 > addPriceTokenAmount;
616  }
617  }
618  if( ammPairs[from] ){
619
```



SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 620

low SEVERITY

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

Source File

- APCToken.sol

```
619 if( token0 != address(this) && bal0 < r0 ){
620 isDel = r0 - bal0 > 0;
621 }
622 }
623 }
624
```



SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 661

low SEVERITY

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

Source File

- APCToken.sol

```
require(swapSwitch, "not start");
for require(block.timestamp > swapStartTime + swapTimeLimit, "not allow");
for require(block.timestamp > swapStartTime + swapTimeLimit, "not allow");
for require(swapSwitch, "not start");
```



SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 667

low SEVERITY

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

Source File

- APCToken.sol

```
666 require(swapSwitch, "not start");
667 require( block.timestamp > swapStartTime + swapTimeLimit, "not allow");
668 }
669
670 if( takeFee && balanceOf(address(0)) >= burnLimit){
671
```



SWC-101 | COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED

LINE 276

low SEVERITY

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

Source File

- APCToken.sol

```
275
276 uint256 toDeleteIndex = valueIndex - 1;
277 uint256 lastIndex = set._values.length - 1;
278
279
280
```



SWC-101 | COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED

LINE 277

low SEVERITY

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

Source File

- APCToken.sol

```
uint256 toDeleteIndex = valueIndex - 1;
uint256 lastIndex = set._values.length - 1;
278
279
280 bytes32 lastvalue = set._values[lastIndex];
281
```



SWC-103 | A FLOATING PRAGMA IS SET.

LINE 7

low SEVERITY

The current pragma Solidity directive is ""^0.6.12"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- APCToken.sol

```
pragma solidity ^0.6.12;
pragma experimental ABIEncoderV2;

10
11
```



SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 439

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "inSwapAndLiquify" is internal. Other possible visibility settings are public and private.

Source File

- APCToken.sol

```
438
439 bool inSwapAndLiquify;
440
441 address public uniswapV2Pair;
442 address public tokenReceiver;
443
```



LINE 280

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- APCToken.sol

```
279
280 bytes32 lastvalue = set._values[lastIndex];
281
282 set._values[toDeleteIndex] = lastvalue;
283 // Update the index for the moved value
284
```



LINE 282

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- APCToken.sol

```
281
282 set._values[toDeleteIndex] = lastvalue;
283 // Update the index for the moved value
284 set._indexes[lastvalue] = toDeleteIndex + 1; // All indexes are 1-based
285
286
```



LINE 309

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- APCToken.sol

```
308  require(set._values.length > index, "EnumerableSet: index out of bounds");
309  return set._values[index];
310  }
311
312  struct Bytes32Set {
313
```



LINE 554

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- APCToken.sol

```
553    for( uint i = 0; i < accounts.length; i++ ){
554    _isExcludedFromFee[accounts[i]] = true;
555    }
556    }
557
558</pre>
```



LINE 706

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- APCToken.sol

```
address[] memory path = new address[](2);
path[0] = address(this);
path[1] = usdt;

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

710
```



LINE 707

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- APCToken.sol

```
706 path[0] = address(this);
707 path[1] = usdt;
708
709 _approve(address(this), address(uniswapV2Router), tokenAmount);
710
711
```



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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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