

SMART CONTRACT SECURITY AUDIT OF BABYCATGIRL



SMART CONTRACT AUDIT | TEAM KYC | PROJECT EVALUATION

RELENTLESSLY SECURING THE PUBLIC BLOCKCHAIN | MADE IN CANADA 🛂

Summary

Auditing Firm InterFi Network

Architecture InterFi "Echelon" Auditing Standard

Smart Contract Audit Approved By Chris | Blockchain Specialist at InterFi Network

Project Overview Approved By

Albert | Marketing Specialist at InterFi Network

Platform Solidity

Audit Check (Mandatory) Static, Software, Auto Intelligent & Manual Analysis

Project Check (Optional) KYC

Consultation Request Date November 08, 2021

Report Date November 09, 2021 (24h fast-tracked)

Audit Summary

InterFi team has performed a line-by-line manual analysis and automated review of the smart contract. The smart contract was analyzed mainly for common smart contract vulnerabilities, exploits, and manipulation hacks. According to the smart contract audit:

- BABYCATGIRL's smart contract source code has LOW RISK SEVERITY.
- ❖ BABYCATGIRL has PASSED the smart contract audit.
- The smart contract can be locked by the owner. This stops or locks all function modules of the smart contract.

For the detailed understanding of risk severity, source code vulnerability, and functional test, kindly refer to the audit. At the time of the audit, the contract is deployed on testnet, the contract can be modified or altered before mainnet deployment.



Table Of Contents

<u>Project Information</u>

Overview	4
InterFi "Echelon" Audit Standard	
Audit Scope & Methodology	6
InterFi's Risk Classification	8
Smart Contract Risk Assessment	
Static Analysis	9
Software Analysis	13
Manual Analysis	15
SWC AttacksSimplified Complete Co	18
Risk Status & Radar Chart	
Report Summary	
Auditor's Verdict	21
<u>Legal Advisory</u>	
Important Disclaimer	22
About InterFi Network	23



Project Overview

InterFi was consulted by BABYCATGIRL on November 06, 2021 to conduct a smart contract security audit of their token source code.

About BABYCATGIRL:

Anime based metaverse token with locked 150m token supply so we can build P2e game each character to do missions, players can participate in betting games to receive rewards.

Project	BABYCATGIRL
Blockchain	Ethereum Rinkeby <mark>Testnet</mark>
Language	Solidity
Contract	0xA468388164F74719E439cafDD5ce33cCefaBb4c1
Website	https://babycatgirl.finance/
Telegram	https://t.me/babycatgirlcommunity
Twitter	https://twitter.com/BabyCatGirlETH



Public logo



Solidity Source Code On Blockchain (Verified Contract Source Code)

https://rinkeby.etherscan.io/address/0xa468388164f74719e439cafdd5ce33ccefabb4c1#code

Contract Name: BabyCatGirl

Compiler Version: v0.8.4+commit.c7e474f2

Optimization Enabled: Yes with 200 runs

Smart Contract
Security Audit



Audit Scope & Methodology

The scope of this report is to audit the smart contract source code of BABYCATGIRL. The source code can be viewed in its entirety on

https://rinkeby.etherscan.io/address/0xa468388164f74719e439cafdd5ce33ccefabb4c1#code

InterFi has scanned the contract and reviewed the project for common vulnerabilities, exploits, hacks, and back-doors. Below is the list of commonly known smart contract vulnerabilities, exploits, and hacks:

Category

Re-entrancy (RE)

Unhandled Exceptions (UE)

Transaction Order Dependency (TO)

Integer Overflow (IO)

Unrestricted Action (UA)

Ownership Takeover

Gas Limit and Loops

Deployment Consistency

Repository Consistency

Data Consistency

Token Supply Manipulation

Access Control and Authorization

Operations Trail and Event Generation

Assets Manipulation

Liquidity Access

Source Code Review

Smart Contract Vulnerabilities

Functional Assessment



InterFi's Echelon Audit Standard

The aim of InterFi's "Echelon" standard is to analyze the smart contract and identify the vulnerabilities and the hacks in the smart contract. Mentioned are the steps used by ECHELON-1 to assess the smart contract:

- 1. Solidity smart contract source code reviewal:
 - Review of the specifications, sources, and instructions provided to InterFi to make sure we understand the size, scope, and functionality of the smart contract.
 - Manual review of code, which is the process of reading source code line-byline to identify potential vulnerabilities.
- 2. Static, Manual, and Automated Al analysis:
 - Test coverage analysis, which is the process of determining whether the test cases are covering the code and how much code is exercised when we run those test cases.
 - 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

Automated 3P frameworks used to assess the smart contract vulnerabilities

- Slither
- Consensys MythX
- Consensys Surya
- Open Zeppelin Code Analyzer
- Solidity Code Complier



InterFi's Risk Classification

Smart contracts are generally designed to manipulate and hold funds denominated in ETH/BNB. This makes them very tempting attack targets, as a successful attack may allow the attacker to directly steal funds from the contract. Below are the typical risk levels of a smart contract:

Vulnerable: A contract is vulnerable if it has been flagged by a static analysis tool as such. As we will see later, this means that some contracts may be vulnerable because of a false-positive.

Exploitable: A contract is exploitable if it is vulnerable and the vulnerability could be exploited by an external attacker. For example, if the "vulnerability" flagged by a tool is in a function which requires to own the contract, it would be vulnerable but not exploitable.

Exploited: A contract is exploited if it received a transaction on the main network which triggered one of its vulnerabilities. Therefore, a contract can be vulnerable or even exploitable without having been exploited.

Sinoit Contract		
Risk severity	Meaning	Security Audit
	This level vulnero	bilities could be exploited easily, and can lead to asset loss, data
! Critical	loss, asset manip	ulation, or data manipulation. They should be fixed right away.
	This level vulnero	bilities are hard to exploit but very important to fix, they carry an
! High	elevated risk of s	mart contract manipulation, which can lead to critical risk severity
	This level vulnero	bilities are should be fixed, as they carry an inherent risk of future
! Medium	exploits, and hac	ks which may or may not impact the smart contract execution.
	This level vulne	abilities can be ignored. They are code style violations, and
! Low	informational sta	tements in the code. They may not affect the smart contract
	execution	



Smart Contract - Static Analysis

Symbol	Meaning
	Function can be modified
	Function is payable
	Function is locked
	Function can be accessed
!	Important functionality

```
**Context** | Implementation |
 L | _msgSender | Internal ← | | |
 L | _msgData | Internal 🛍 |
 **IERC20** | Interface | |||
 L | totalSupply | External 📒 |
 L | balanceOf | External | |
                               |N0 |
 👢 | transfer | External 📒 | 🥌
   | allowance | External | |
                               |N0 |
 📘 | approve | External 📒 | 🥌
                              |NO | |
 👢 | transferFrom | External 📒 | 🥮 |NO 📙 |
 **SafeMath** | Library |
 └ | add | Internal 🗎 |
    sub | Internal 🖴
    sub | Internal 🖴
    mul | Internal 🖴
    div | Internal 🖴
    div | Internal 🔒
     mod | Internal 🖴
    mod | Internal 🖴
||||||
 **Address** | Library | |||
 📙 | sendValue | Internal 🗎 | 🥌
 L | functionCall | Internal 🗎 | 🥌
 👢 | functionCall | Internal 🛍 | 🥌
 👢 | functionCallWithValue | Internal 🖴
 └ | functionCallWithValue | Internal 🔒
    _functionCallWithValue | Private 💕
```



```
**Ownable** | Implementation | Context |||
   | <Constructor> | Public ! | =
     owner | Public | | |NO! |
     renounceOwnership | Public
                                       | onlyOwner |
    transferOwnership | Public
                                       | onlyOwner |
     getUnlockTime | Public | |
                                  |N0 |
     getTime | Public | |
                            |N0 |
          | Public | | 🛑
                          | onlyOwner |
      <mark>mlock</mark> | Public 🏮 | 🛑 |NO 🎙 |
\Pi\Pi\Pi\Pi
 **IUniswapV2Factory** | Interface | |||
 L | feeTo | External | |
                            |NO |
   | feeToSetter | External ! |
                                  |NO |
    getPair | External 📒 |
                              |N0 |
    allPairs | External | | |NO! |
 L | allPairsLength | External | | NO! |
    createPair | External 📒 | 🥮 |NO 📒 |
     setFeeTo | External 👤 | 🥌
                               setFeeToSetter | External | | 🛑 |NO! |
111111
 **IUniswapV2Pair** | Interface | |||
   symbol | External
                             |N0 !
     decimals | External ! |
                               |N0
     totalSupply | External | |
                                  |N0 |
     balanceOf | External ! |
                                |NO ! |
     allowance | External
                                |N0 |
     approve | External
                                |N0
     transfer | External | |
                                |N0
    transferFrom | External 📒 | 🥌
                                    |N0 |
     DOMAIN_SEPARATOR | External | |
                                       |N0
     PERMIT_TYPEHASH | External | |
                                     |NO |
     nonces | External 📒 |
                             |NO |
     permit | External 📒 |
                               |N0 |
     MINIMUM_LIQUIDITY | External
                                       |N0 | |
     factory | External | |
                              |N0 |
     token0 | External 📒 |
                             |NO | |
     token1 | External | |
                             |N0 |
     getReserves | External ! |
                                  |N0 |
     price0CumulativeLast | External
                                           |N0 |
    price1CumulativeLast | External
                                           |N0 |
     kLast | External | |
                            IN0
     burn | External | |
                             |N0
     swap | External 📒 |
                             |N0
                             |N0
     skim | External
     sync | External 📒 | 🥌
     initialize | External 📒 | 🛑
\prod
 **IUniswapV2Router01** | Interface | |||
    factory | External | | |NO
```



```
WETH | External | |
                          |N0 |
     addLiquidity | External 📒 | 🥌
                                   |NO ! |
     addLiquidityETH | External
                                | 🕮 |N0 <mark>!</mark>
     removeLiquidity | External ! |
                                      INO !
     removeLiquidityETH | External | |
                                        |N0 |
     removeLiquidityWithPermit | External
     removeLiquidityETHWithPermit | External
     swapExactTokensForTokens | External 1
                                              INO !
     swapTokensForExactTokens | External
                                              INO
     swapExactETHForTokens | External
     swapTokensForExactETH | External
                                            IN0
     swapExactTokensForETH | External
     swapETHForExactTokens | External | | 🚳
     quote | External | |
                           |NO | |
     getAmountOut | External ! |
                                getAmountIn | External | |
                                |NO |
     getAmountsOut | External | | NO!
     getAmountsIn | External | |
                                 |NO | |
\Pi\Pi\Pi\Pi
 **IUniswapV2Router02** | Interface | IUniswapV2Router01 |||
     removeLiquidityETHSupportingFeeOnTransferTokens | External 🕴 | 🧼 | NO!
     removeLiquidityETHWithPermitSupportingFeeOnTransferTokens | External
     swapExactTokensForTokensSupportingFeeOnTransferTokens | External 🚶 | 🥮
                                                                         |NO |
     swapExactETHForTokensSupportingFeeOnTransferTokens | External
     swapExactTokensForETHSupportingFeeOnTransferTokens | External 🖡 | 🥌
 **BabyCatGirl** | Implementation | Context, IERC20, Ownable |||
     <Constructor> | Public ! | 🛑
                        |NO |
     name | Public | |
    symbol | Public | | NO
     decimals | Public | | NO! |
     totalSupply | Public | | NO | |
     balanceOf | Public | |
                             |N0 |
    transfer | Public 📒 | 🥌
                              |N0 |
     allowance | Public | |
                             |N0 |
     approve | Public | |
                             INO
     transferFrom | Public 🚺 | 🥮 |NO
     increaseAllowance | Public
     decreaseAllowance | Public | |
                                      |N0 |
     totalFees | Public | | NO | |
     tokenFromReflection | Public | | NO! |
     _approve | Private f | 🛑 | |
     _transfer | Private 😭 | 🥌
     setFee | Private 🛍 | 🥮 | |
     swapAndLiquify | Private 🔐 | 🥌 | lockTheSwap |
     addLiquidity | Private 😭 | 🥌
     swapTokensForEth | Private 🔐
     swapETHForTokens | Private 🔐
```



```
_tokenTransfer | Private 🛍 | 🥌
 | transferStandard | Private 🛍 |
 | _transferToExcluded | Private 🔐 | 🥌
 | _transferFromExcluded | Private 😭 |
👢 | _transferBothExcluded | Private 😭 | 🥌
 | _reflectFee | Private 🗳 | 🧶 | |
 | _getValues | Private 🔐 | | |
 | _getRValues | Private 🛍 | | |
 | _getRate | Private 臂 | | |
L | _takeLiquidity | Private 🛍 | 🥮 | |
L | removeAllFee | Private 🗳 | 🥮 | |
L | restoreAllFee | Private 🔐 | 🥮 | |
L | isAuthorized | Public | | onlyOwner |
L | isExcludedFromFee | Public | | NO | |
L | excludeFromFee | Public | | 🛑 | onlyOwner |
👢 | includeInFee | Public 📒 | 🥌 | onlyOwner |
👢 | setDevelopmentFeePercentage | External 🖡 | 🥮 | onlyOwner |
 | setMaxTxAmount | External | | 🛑 | onlyOwner |
💄 | setNumTokensSellToAddToLiquidity | External 🚦 | 🥌 | onlyOwner |
L | setDevelopmentWallet | External | | 🛑 | onlyOwner |
L | transferToAddressETH | Private 🔐 | 🥮 | |
L | <Receive Ether> | External | | 💹 |NO! |
```



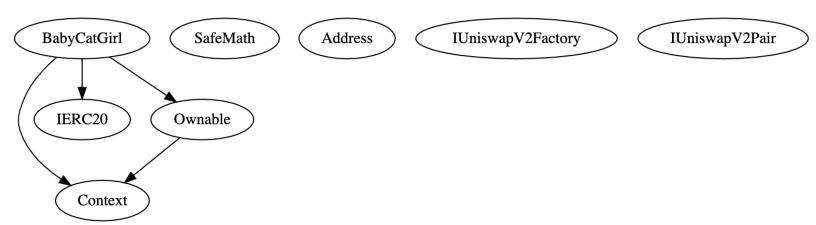
Smart Contract - Software Analysis

Function Signatures

```
39509351 => increaseAllowance(address,uint256)
18160ddd => totalSupply()
313ce567 => decimals()
95d89b41 => symbol()
06fdde03 => name()
893d20e8 \Rightarrow get0wner()
70a08231 => balanceOf(address)
a9059cbb => transfer(address,uint256)
dd62ed3e => allowance(address,address)
095ea7b3 => approve(address,uint256)
23b872dd => transferFrom(address,address,uint256)
119df25f => msgSender()
8b49d47e => _msgData()
771602f7 => add(uint256,uint256)
b67d77c5 => sub(uint256,uint256)
e31bdc0a => sub(uint256,uint256,string)
c8a4ac9c => mul(uint256,uint256)
a391c15b => div(uint256,uint256)
b745d336 => div(uint256,uint256,string)
f43f523a => mod(uint256,uint256)
71af23e8 => mod(uint256,uint256,string)
8da5cb5b => owner()
715018a6 => renounceOwnership()
f2fde38b => transfer0wnership(address)
d29d44ee => transfer0wnership(address)
a457c2d7 => decreaseAllowance(address,uint256)
30e0789e => transfer(address,address,uint256)
104e81ff => approve(address,address,uint256)
```



Inheritance Graph



Interfi

Smart Contract Security Audit



Smart Contract – Manual Analysis

Function	Description	Tested	Verdict
Total Supply	provides information about the total token supply	Yes	Passed
Balance Of	provides account balance of the owner's account	Yes	Passed
Transfer	executes transfers of a specified number of tokens to a specified address	Yes	Passed
Approve	allow a spender to withdraw a set number of tokens from a specified account	Yes	Passed
Allowance	returns a set number of tokens from a spender to the owner	Yes	Passed
Buy Back	is an action in which the project buys back its tokens from the existing holders usually at a market price	NA	NA
Burn	executes transfers of a specified number of tokens to a burn address	NA	NA
Mint	executes creation of a specified number of tokens and adds it to the total supply	NA	NA
Rebase	circulating token supply adjusts (increases or decreases) automatically according to a token's price fluctuations	NA	NA
Blacklist	stops specified wallets from interacting with the smart contract function modules	Yes	Passed
Lock	stops or locks all function modules of the smart contract	Yes	Passed



Important Information

- * Be aware that active smart contract owner privileges constitute an elevated impact to smart contract's safety and security.
- Owner can-not lock or burn user assets.
- Owner can-not mint tokens after launch.
- The smart contract can be locked by the owner. This stops or locks all function modules of the smart contract.
- The smart contract can stop specified wallets from interacting with the smart contract function modules. It uses Blacklist function.
- BABYCATGIRL's smart contract utilizes "SafeMath" function to avoid common smart contract vulnerabilities.

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

    return c;
}
function sub(uint256 a, uint256 b) internal pure returns (uint256) {
    return sub(a, b, 'SafeMath: subtraction overflow');
}
uint256 c = a * b;
    require(c / a == b, 'SafeMath: multiplication overflow');

    return c;
}
```



❖ BABYCATGIRL's smart contract has a development tax of 27% at sell.

```
uint256 public _liquidityFee = 0;
uint256 private _previousLiquidityFee = _liquidityFee;

uint256 public _marketingFee = 5;
uint256 private _previousMarketingFee = _marketingFee;

uint256 public _developmentFee = 5;
uint256 private _previousDevelopmentFee = _developmentFee;

uint256 public _saleLiquidityFee = 2;
uint256 public _saleMarketingFee = 5;
uint256 public _saleDevelopmentFee = 27;
```



Smart Contract Security Audit



Smart Contract - SWC Attacks

SWC ID	Description	Verdict
SWC-101	Integer Overflow and Underflow	Passed
SWC-102	Outdated Compiler Version	! Low
swc-103	Floating Pragma	Passed
SWC-104	Unchecked Call Return Value	Passed
SWC-105	Unprotected Ether Withdrawal	Passed
SWC-106	Unprotected SELFDESTRUCT Instruction	Passed
SWC-107	Re-entrancy Company of the Company o	Passed
SWC-108	State Variable Default Visibility	Passed
SWC-109	Uninitialized Storage Pointer	Passed
SWC-110	Assert Violation Smart Contract	Passed
swc-111	Use of Deprecated Solidity Functions	Passed
SWC-112	Delegate Call to Untrusted Callee	Passed
SWC-113	DoS with Failed Call	Passed
SWC-114	Transaction Order Dependence	Passed
SWC-115	Authorization through tx.origin	Passed
SWC-116	Block values as a proxy for time	Passed
SWC-117	Signature Malleability	Passed
SWC-118	Incorrect Constructor Name	Passed



SWC-119	Shadowing State Variables	Passed
SWC-120	Weak Sources of Randomness from Chain Attributes	Passed
SWC-121	Missing Protection against Signature Replay Attacks	Passed
SWC-122	Lack of Proper Signature Verification	Passed
SWC-123	Requirement Violation	Passed
SWC-124	Write to Arbitrary Storage Location	Passed
SWC-125	Incorrect Inheritance Order	Passed
SWC-126	Insufficient Gas Griefing	Passed
SWC-127	Arbitrary Jump with Function Type Variable	Passed
SWC-128	DoS With Block Gas Limit	Passed
SWC-129	Typographical Error	Passed
SWC-130	Right-To-Left-Override control character (U+202E)	Passed
SWC-131	Presence of unused variables	Passed
SWC-132	Unexpected Ether balance	Passed
SWC-133	Hash Collisions With Multiple Variable Length Arguments	Passed
SWC-134	Message call with hardcoded gas amount	Passed
SWC-135	Code With No Effects (Irrelevant/Dead Code)	Passed
SWC-136	Unencrypted Private Data On-Chain	Passed



Smart Contract - Risk Status & Radar Chart

Risk Severity	Status
! Critical	None critical severity issues identified
! High	None high severity issues identified
! Medium	None medium severity issues identified
! Low	None low severity issues identified
Passed	Score out of 100 Compiler Check 100 Interface Safety Manual Analysis Software Analysis
	Compiler Check 96
	Static Analysis 91

Software Analysis

Manual Analysis

Interface Safety

92

91

82



Auditor's Verdict

InterFi team has performed a line-by-line manual analysis and automated review of the smart contract. The smart contract was analyzed mainly for common smart contract vulnerabilities, exploits, and manipulation hacks.

BABYCATGIRL's smart contract source code has LOW RISK SEVERITY.

BABYCATGIRL has PASSED the smart contract audit.

BABYCATGIRL's smart contract can be locked by the owner. This stops or locks all function modules of the smart contract.

BABYCATGIRL's smart contract has a 27% Development Tax at sell.



Auditor's Note:

- Be aware that active smart contract owner privileges constitute an elevated impact to smart contract's safety and security.
- At the time of the audit, the contract is deployed on testnet, the contract can be modified or altered before mainnet deployment.
- Project's liquidity pair isn't checked and verified due to out of scope.
- Project website is not checked due to out of scope. The website hasn't been reviewed for SSL and lighthouse report.



Important Disclaimer

InterFi Network provides contract auditing and project verification services for blockchain projects. The purpose of the audit is to analyse the on-chain smart contract source code, and to provide basic overview of the project. This report should not be transmitted, disclosed, referred to, or relied upon by any person for any purposes without InterFi's prior written consent.

InterFi provides the easy-to-understand assessment of the project, and the smart contract (otherwise known as the source code). The audit makes no statements or warranties on the security of the code. It also cannot be considered as an enough assessment regarding the utility and safety of the code, bug-free status, or any other statements of the contract. While we have used all the data at our disposal to provide the transparent analysis, it is important to note that you should not rely on this report only — we recommend proceeding with several independent audits and a public bug bounty program to ensure the security of smart contracts. Be aware that smart contracts deployed on a blockchain aren't resistant from external vulnerability, or a hack. Be aware that active smart contract owner privileges constitute an elevated impact to smart contract's safety and security. Therefore, InterFi does not guarantee the explicit security of the audited smart contract.

The analysis of the security is purely based on the smart contracts alone. No applications or operations were reviewed for security. No product code has been reviewed.

This report should not be considered as an endorsement or disapproval of any project or team.

The information provided on this report does not constitute investment advice, financial advice, trading advice, or any other sort of advice and you should not treat any of the report's content as such. Do conduct your own due diligence and consult your financial advisor before making any investment decisions.



About InterFi Network

InterFi Network provides intelligent blockchain solutions. InterFi is developing an ecosystem that is seamless and responsive. Some of our services: Blockchain Security, Token Launchpad, NFT Marketplace, etc. InterFi's mission is to interconnect multiple services like Blockchain Security, DeFi, Gaming, and Marketplace under one ecosystem that is seamless, multi-chain compatible, scalable, secure, fast, responsive, and easy-to-use.

InterFi is built by a decentralized team of UI experts, contributors, engineers, and enthusiasts from all over the world. Our team currently consists of 6+ core team members, and 10+ casual contributors. InterFi provides manual, static, and automatic smart contract analysis, to ensure that project is checked against known attacks and potential vulnerabilities.

To learn more, visit https://interfi.network

To view our audit portfolio, visit https://github.com/interfinetwork

To book an audit, message https://t.me/interfiaudits





