Cyberscope

Audit Report

Coffy DeFi

October 2024

Network ETH

Address 0x9eb13BF74345eCeCAcC7Ae244aF4568e3Dd7bA34

Audited by © cyberscope

Analysis

Critical Medium Minor / Informative Pass

Severity	Code	Description	Status
●	ST	Stops Transactions	Passed
●	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
	CCR	Contract Centralization Risk	Unresolved
	DDP	Decimal Division Precision	Unresolved
	PLPI	Potential Liquidity Provision Inadequacy	Unresolved
	PTRP	Potential Transfer Revert Propagation	Unresolved
	RRA	Redundant Repeated Approvals	Unresolved
	L04	Conformance to Solidity Naming Conventions	Unresolved
	L09	Dead Code Elimination	Unresolved
	L13	Divide before Multiply Operation	Unresolved
	L16	Validate Variable Setters	Unresolved
	L17	Usage of Solidity Assembly	Unresolved
	L19	Stable Compiler Version	Unresolved
	L20	Succeeded Transfer Check	Unresolved

Table of Contents

Risk Classification

The criticality of findings in Cyberscope's smart contract audits is determined by evaluating multiple variables. The two primary variables are:

1. **Likelihood of Exploitation**: This considers how easily an attack can be executed, including the economic feasibility for an attacker.
2. **Impact of Exploitation**: This assesses the potential consequences of an attack, particularly in terms of the loss of funds or disruption to the contract's functionality.

Based on these variables, findings are categorized into the following severity levels:

1. **Critical**: Indicates a vulnerability that is both highly likely to be exploited and can result in significant fund loss or severe disruption. Immediate action is required to address these issues.
2. **Medium**: Refers to vulnerabilities that are either less likely to be exploited or would have a moderate impact if exploited. These issues should be addressed in due course to ensure overall contract security.
3. **Minor**: Involves vulnerabilities that are unlikely to be exploited and would have a minor impact. These findings should still be considered for resolution to maintain best practices in security.
4. **Informative**: Points out potential improvements or informational notes that do not pose an immediate risk. Addressing these can enhance the overall quality and robustness of the contract.

Severity	Likelihood / Impact of Exploitation
Critical	Highly Likely / High Impact
Medium	Less Likely / High Impact or Highly Likely/ Lower Impact
Minor / Informative	Unlikely / Low to no Impact

Review

Contract Name	CoffyDeFi
Compiler Version	v0.8.27+commit.40a35a09
Optimization	200 runs
Explorer	https://etherscan.io/address/0x9eb13bf74345ececacc7ae244af4568e3dd7ba34
Address	0x9eb13bf74345ececacc7ae244af4568e3dd7ba34
Network	ETH
Symbol	COFFI
Decimals	18
Total Supply	1,000,000,000

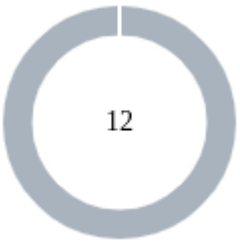
Audit Updates

Initial Audit	19 Sep 2024 https://github.com/cyberscope-io/audits/blob/main/coffi/v1/audit.pdf
Corrected Phase 2	25 Sep 2024 https://github.com/cyberscope-io/audits/blob/main/coffi/v2/audit.pdf
Corrected Phase 3	02 Oct 2024

Source Files

Filename	SHA256
CoffyDeFi.sol	818a8a075e4b4c3bec7d8165f5da6c9f60b11b32b01f525a0e0f21392a955778

Findings Breakdown



Critical	0
Medium	0
Minor / Informative	12

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	0	0	0	0
Medium	0	0	0	0
Minor / Informative	12	0	0	0

CCR - Contract Centralization Risk

Criticality	Minor / Informative
Location	CoffyDeFi.sol#L885,904,909,914,919,932,937,998,1011,1301,1346,1353
Status	Unresolved

Description

The contract's functionality and behavior are heavily dependent on external parameters or configurations. While external configuration can offer flexibility, it also poses several centralization risks that warrant attention. Centralization risks arising from the dependence on external configuration include Single Point of Control, Vulnerability to Attacks, Operational Delays, Trust Dependencies, and Decentralization Erosion.

```
function setFees(uint256 burnFee_,uint256 reflectionFee_,
uint256 liquidityPoolFee_,uint256 marketingFee_,uint256 developerFee_)
public onlyOwner {}

function setMarketingAddress(address _marketingAddress) external
onlyOwner {}

function setDeveloperAddress(address _developerAddress) external
onlyOwner {}

function setSwapAndLiquifyEnabled(bool _enabled) public onlyOwner {}

function setMaxTxAmountPercent(uint256 percentTimes10) external
onlyOwner {}

function excludeFromFee(address account) public onlyOwner {}

function includeInFee(address account) public onlyOwner {}

function excludeAccountFromReward(address account) public onlyOwner {}

function includeAccountinReward(address account) public onlyOwner {}

function presale(bool _presale) external onlyOwner {}

function withdrawETH() external onlyOwner {}

function withdrawToken(address token) external onlyOwner {}
```

Recommendation

To address this finding and mitigate centralization risks, it is recommended to evaluate the feasibility of migrating critical configurations and functionality into the contract's codebase itself. This approach would reduce external dependencies and enhance the contract's self-sufficiency. It is essential to carefully weigh the trade-offs between external configuration flexibility and the risks associated with centralization.

DDP - Decimal Division Precision

Criticality	Minor / Informative
Location	CoffyDeFi.sol#L1234
Status	Unresolved

Description

Division of decimal (fixed point) numbers can result in rounding errors due to the way that division is implemented in Solidity. Thus, it may produce issues with precise calculations with decimal numbers.

Solidity represents decimal numbers as integers, with the decimal point implied by the number of decimal places specified in the type (e.g. decimal with 18 decimal places). When a division is performed with decimal numbers, the result is also represented as an integer, with the decimal point implied by the number of decimal places in the type. This can lead to rounding errors, as the result may not be able to be accurately represented as an integer with the specified number of decimal places.

Hence, the splitted shares will not have the exact precision and some funds may not be calculated as expected.

```
transferToAddressETH(
marketingAddress,
((transferredBalance) * (marketingFee * 10)) /
(combinedLiquidityFee * 10 - ((liquidityPoolFee * 10) / 2)));

transferToAddressETH(
developerAddress,
((transferredBalance) * (developerFee * 10)) /
(combinedLiquidityFee * 10 - ((liquidityPoolFee * 10) / 2)));
```

Recommendation

The team is advised to take into consideration the rounding results that are produced from the solidity calculations. The contract could calculate the subtraction of the divided funds in the last calculation in order to avoid the division rounding issue.

PLPI - Potential Liquidity Provision Inadequacy

Criticality	Minor / Informative
Location	CoffyDeFi.sol#L1258
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.

```
function swapTokensForEth(uint256 tokenAmount) private {
// generate the uniswap pair path of token -> weth
address[] memory path = new address[](2);
path[0] = address(this);
path[1] = uniswapV2Router.WETH();

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

        // make the swap
    uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(
    tokenAmount,
    0, // accept any amount of ETH
    path,
    address(this), // The contract
    block.timestamp
    );

emit SwapTokensForETH(tokenAmount, path);
}
```

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.

PTRP - Potential Transfer Revert Propagation

Criticality	Minor / Informative
Location	CoffyDeFi.sol#L904,1313
Status	Unresolved

Description

The contract sends funds to a `recipient` as part of the transfer flow. This address can either be a wallet address or a contract. If the address belongs to a contract then it may revert from incoming payment. As a result, the error will propagate to the token's contract and revert the transfer.

```
function transferToAddressETH(
    address payable recipient,
    uint256 amount
    ) private {
    (bool success, ) = recipient.call{value: amount}("");
    if(success) {
        emit FeeTransferred(recipient, amount);
    }
}
```

```
function setMarketingAddress(address _marketingAddress) external
onlyOwner {
    marketingAddress = payable(_marketingAddress);
    emit MarketingAddressUpdated(_marketingAddress);
}

function setDeveloperAddress(address _developerAddress) external
onlyOwner {
    developerAddress = payable(_developerAddress);
    emit DeveloperAddressUpdated(_developerAddress);
}
```

Recommendation

The contract should tolerate the potential revert from the underlying contracts when the interaction is part of the main transfer flow. This could be achieved by not allowing set contract addresses or by sending the funds in a non-revertable way.

RRA - Redundant Repeated Approvals

Criticality	Minor / Informative
Location	CoffyDeFi.sol#L1278
Status	Unresolved

Description

The contract is designed to `approve` token transfers during the contract's operation by calling the _approve function before specific operations. This approach results in additional gas costs since the approval process is repeated for every operation execution, leading to inefficiencies and increased transaction expenses.

```
function addLiquidity(uint256 tokenAmount, uint256 ethAmount) private {
// approve token transfer to cover all possible scenarios
_approve(address(this), address(uniswapV2Router), tokenAmount);

    // add the liquidity
    uniswapV2Router.addLiquidityETH{value: ethAmount}(
        address(this),
        tokenAmount,
        0, // slippage is unavoidable
        0, // slippage is unavoidable
        owner(),
        block.timestamp
    );
}
```

Recommendation

Since the approved address is a trusted third-party source, it is recommended to optimize the contract by approving the maximum amount of tokens once in the initial set of the variable, rather than before each operation. This change will reduce the overall gas consumption and improve the efficiency of the contract.

L04 - Conformance to Solidity Naming Conventions

Criticality	Minor / Informative
Location	CoffyDeFi.sol#L517,519,549,591,904,909,914,1301
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);
address _marketingAddress
address _developerAddress
bool _enabled
bool _presale
```

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/stable/style-guide.html#naming-conventions.

L09 - Dead Code Elimination

Criticality	Minor / Informative
Location	CoffyDeFi.sol#L352,377,389
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 _transfer(
        address sender,
        address recipient,
        uint256 amount
    ) internal virtual {
        require(sender != address(0), "ERC20: transfer from the zero
address");
...
        }
        _balances[recipient] += amount;

        emit Transfer(sender, recipient, amount);

        _afterTokenTransfer(sender, recipient, 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	CoffyDeFi.sol#L1157,1158,1169,1171,1185,1187,1245
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.

```
uint256 tFee = (tAmount * fee) / 100
uint256 rFee = tFee * currentRate
```

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.

L16 - Validate Variable Setters

Criticality	Minor / Informative
Location	CoffyDeFi.sol#L905,910
Status	Unresolved

Description

The contract performs operations on variables that have been configured on user-supplied input. These variables are missing of proper check for the case where a value is zero. This can lead to problems when the contract is executed, as certain actions may not be properly handled when the value is zero.

```
marketingAddress = payable(_marketingAddress)
developerAddress = payable(_developerAddress)
```

Recommendation

By adding the proper check, the contract will not allow the variables to be configured with zero value. This will ensure that the contract can handle all possible input values and avoid unexpected behavior or errors. Hence, it can help to prevent the contract from being exploited or operating unexpectedly.

L17 - Usage of Solidity Assembly

Criticality	Minor / Informative
Location	CoffyDeFi.sol#L184
Status	Unresolved

Description

Using assembly can be useful for optimizing code, but it can also be error-prone. It's important to carefully test and debug assembly code to ensure that it is correct and does not contain any errors.

Some common types of errors that can occur when using assembly in Solidity include Syntax, Type, Out-of-bounds, Stack, and Revert.

```
assembly {
        let returndata_size := mload(returndata)
        revert(add(32, returndata), returndata_size)
}
```

Recommendation

It is recommended to use assembly sparingly and only when necessary, as it can be difficult to read and understand compared to Solidity code.

L19 - Stable Compiler Version

Criticality	Minor / Informative
Location	CoffyDeFi.sol#L3
Status	Unresolved

Description

The `^` symbol indicates that any version of Solidity that is compatible with the specified version (i.e., any version that is a higher minor or patch version) can be used to compile the contract. The version lock is a mechanism that allows the author to specify a minimum version of the Solidity compiler that must be used to compile the contract code. This is useful because it ensures that the contract will be compiled using a version of the compiler that is known to be compatible with the code.

```
pragma solidity ^0.8.0;
```

Recommendation

The team is advised to lock the pragma to ensure the stability of the codebase. The locked pragma version ensures that the contract will not be deployed with an unexpected version. An unexpected version may produce vulnerabilities and undiscovered bugs. The compiler should be configured to the lowest version that provides all the required functionality for the codebase. As a result, the project will be compiled in a well-tested LTS (Long Term Support) environment.

L20 - Succeeded Transfer Check

Criticality	Minor / Informative
Location	CoffyDeFi.sol#L1356
Status	Unresolved

Description

According to the ERC20 specification, the transfer methods should be checked if the result is successful. Otherwise, the contract may wrongly assume that the transfer has been established.

```
IERC20(token).transfer(owner(), _amount)
```

Recommendation

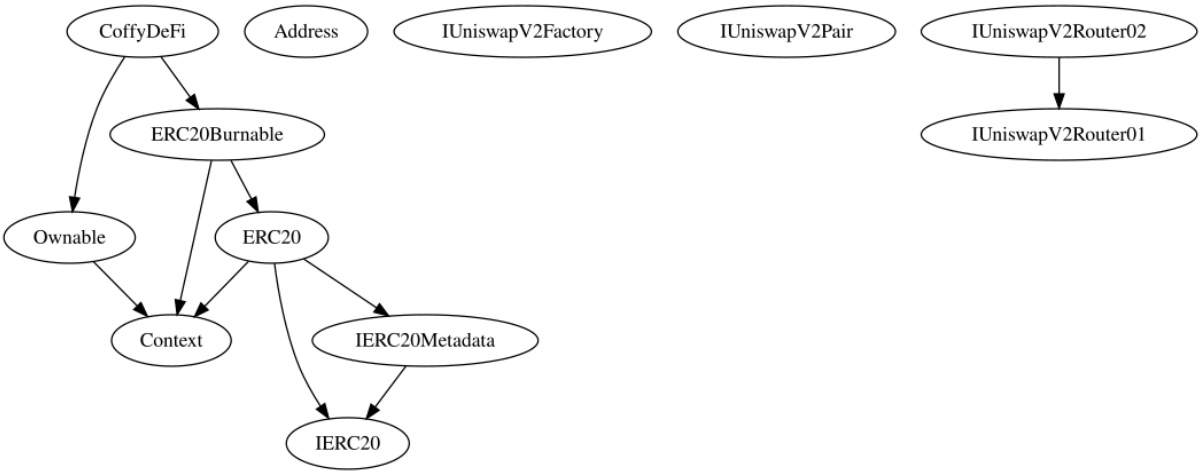
The contract should check if the result of the transfer methods is successful. The team is advised to check the SafeERC20 library from the Openzeppelin library.

Functions Analysis

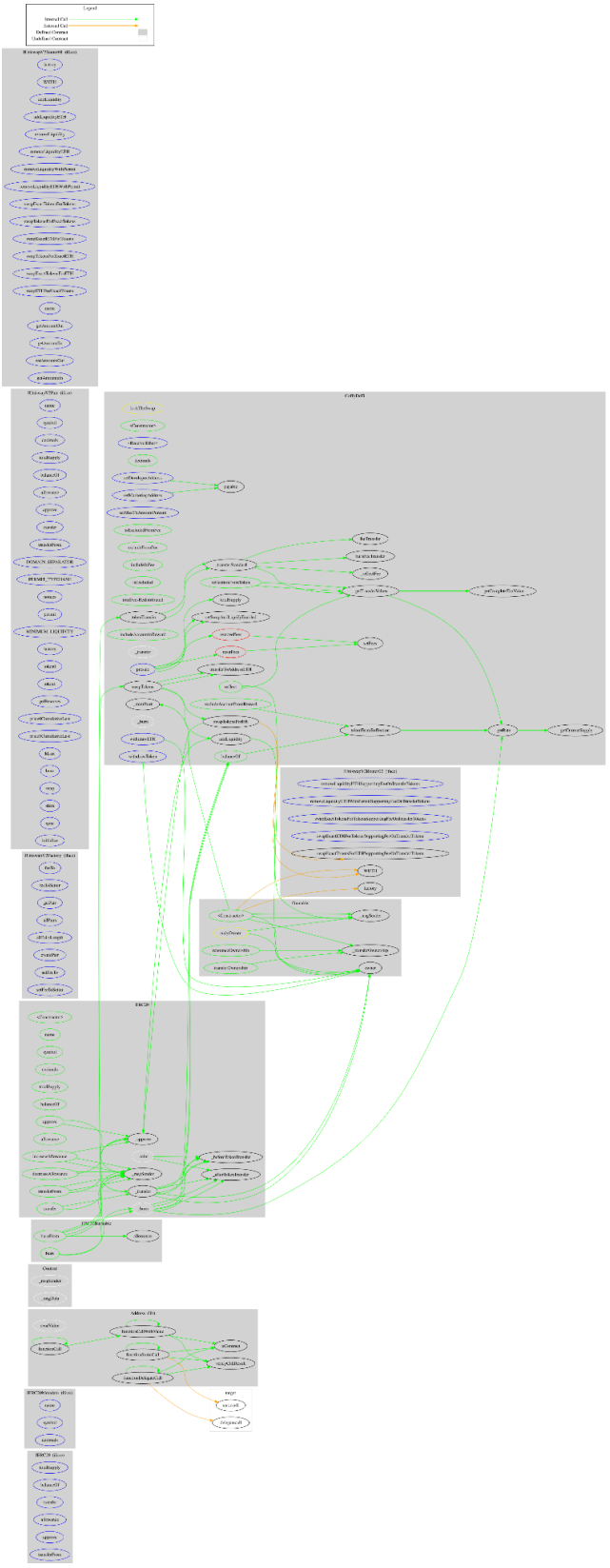
Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
CoffyDeFi	Implementation	ERC20Burnable, Ownable		
		Public	Payable	ERC20
		External	Payable	-
	decimals	Public		-
	totalSupply	Public		-
	balanceOf	Public		-
	setFees	Public	✓	onlyOwner
	setMarketingAddress	External	✓	onlyOwner
	setDeveloperAddress	External	✓	onlyOwner
	setSwapAndLiquifyEnabled	Public	✓	onlyOwner
	setMaxTxAmountPercent	External	✓	onlyOwner
	isExcludedFromFee	Public		-
	excludeFromFee	Public	✓	onlyOwner
	includeInFee	Public	✓	onlyOwner
	isExcluded	Public		-
	totalFeesRedistributed	Public		-
	_mintStart	Private	✓	
	reflect	Public	✓	-
	reflectionFromToken	Public		-
	tokenFromReflection	Private		

	excludeAccountFromReward	Public	✓	onlyOwner
	includeAccountinReward	Public	✓	onlyOwner
	_transfer	Internal	✓	
	_tokenTransfer	Private	✓	
	_transferStandard	Private	✓	
	_getTransferValues	Private		
	_getCompleteTaxValue	Private		
	_reflectFee	Private	✓	
	burnFeeTransfer	Private	✓	
	feeTransfer	Private	✓	
	_getRate	Private		
	_getCurrentSupply	Private		
	swapTokens	Private	✓	lockTheSwap
	swapTokensForEth	Private	✓	
	addLiquidity	Private	✓	
	removeFees	Private	✓	
	resetFees	Private	✓	
	presale	External	✓	onlyOwner
	transferToAddressETH	Private	✓	
	_burn	Internal	✓	
	withdrawETH	External	✓	onlyOwner
	withdrawToken	External	✓	onlyOwner

Inheritance Graph



Flow Graph



Summary

CoffyDefi contract implements a token mechanism. This audit investigates security issues, business logic concerns and potential improvements. The Smart Contract analysis reported no critical issues. The contract Owner can access some admin functions that cannot be used in a malicious way. There is also a limit of max 5% fees.

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Blockchain technology and cryptographic assets present a high level of ongoing risk Cyberscope's position is that each company and individual are responsible for their own due diligence and continuous security Cyberscope's goal is to help reduce the attack vectors and the high level of variance associated with utilizing new and consistently changing technologies and in no way claims any guarantee of security or functionality of the technology we agree to analyze. The assessment services provided by Cyberscope are subject to dependencies and are under continuing development. 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 Cryptographic tokens are emergent technologies and carry with them high levels of technical risk and uncertainty. The assessment reports could include false positives false negatives and other unpredictable results. The services may access and depend upon multiple layers of third parties.

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Cyberscope is one of the leading smart contract audit firms in the crypto space and has built a high-profile network of clients and partners.

The Cyberscope team

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