



SOLIDProof
Bring trust into your projects

Blockchain Security | Smart Contract Audits | KYC

MADE IN GERMANY

Audit

Security Assessment
21. December, 2021

For



Disclaimer	3
Description	5
Project Engagement	5
Logo	5
Contract Link	5
Methodology	7
Used Code from other Frameworks/Smart Contracts (direct imports)	8
Tested Contract Files	9
Source Lines	10
Risk Level	10
Capabilities	11
Scope of Work	13
Inheritance Graph	13
Verify Claims	14
Modifiers	20
CallGraph	21
Source Units in Scope	22
Critical issues	23
High issues	23
Medium issues	23
Low issues	23
Informational issues	23
Audit Comments	24
SWC Attacks	25

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Version	Date	Description
1.0	21. December 2021	<ul style="list-style-type: none">• Layout project• Automated- /Manual-Security Testing• Summary

Network

Binance Smart Chain (BEP20)

Website

<https://beardog.finance>

Telegram

<http://t.me/beardog9>

https://t.me/Beardog_ANN

Twitter

https://twitter.com/Bear_Dog9

Discord

<https://discord.gg/8Ze5uXcga6>



Description

BEARDOG is a meme token 2.0 Doge brother and Shiba killer with utility and application for pet/crypto lovers world wide and unlike other Dog tokens which lack utility and Metaverse Gaming function.

Project Engagement

During the 17th of December 2021, **BearDog 9 Team** engaged Solidproof.io to audit smart contracts that they created. The engagement was technical in nature and focused on identifying security flaws in the design and implementation of the contracts. They provided Solidproof.io with access to their code repository and whitepaper.

Logo



Contract Link v1.0

- Github
 - <https://github.com/beardog9/codes>
 - Commit: a756daf94babb0427c28d4eb5ac7a8a4f709c386
- Mainnet
<https://bscscan.com/address/0x12a04ac37D0CE6b02b51111cb4dbcb05D43C9C4A#code>

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

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.





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 SolidProof 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 SolidProof 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.

Used Code from other Frameworks/Smart Contracts (direct imports)

Imported packages:

```
Context
Ownable
IERC20
IERC20Metadata
DividendPayingTokenOptionalInterface
DividendPayingTokenInterface
 SafeMathInt
 SafeMathUint
 SafeMath
ERC20
DividendPayingToken
IUniswapV2Router01
IUniswapV2Router02
IUniswapV2Factory
IUniswapV2Pair
 IterableMapping
DividendTracker
```


Tested Contract Files

This audit covered the following files listed below with a SHA-1 Hash.

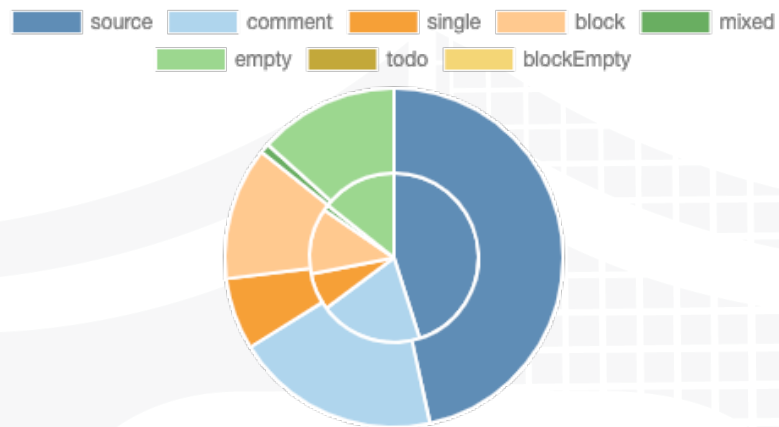
A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.

v1.0

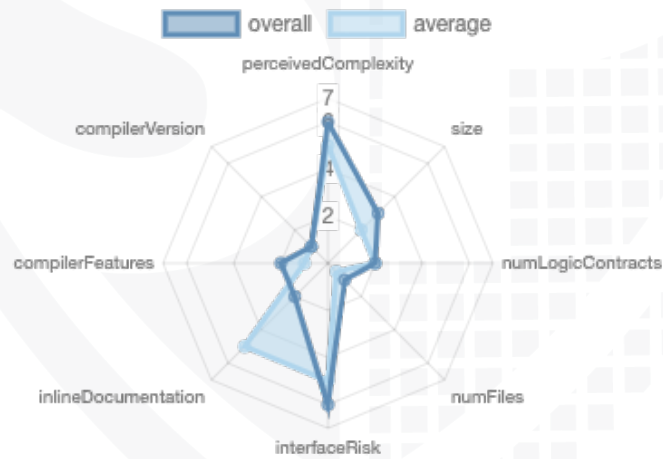
File Name	SHA-1 Hash
contracts/Beardog.sol	a919becf5933e502c40ce03025f30685ff79fe5a
contracts/IterableMapping.sol	a39aa38f1e18189b2ff01fbbff57050555585cc4

Metrics

Source Lines v1.0



Risk Level v1.0



Capabilities

Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	5	5	8	1

Exposed Functions

This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.

Version	Public	Payable
1.0	179	9

Version	External	Internal	Private	Pure	View
1.0	142	134	6	26	77

State Variables

Version	Total	Public
1.0	65	43

Capabilities

Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	0.8.9		yes	yes (1 asm blocks)	

Version	Transfers ETH	Low-Level Calls	DelegateCall	Uses Hash Functions	ECRecover	New/Create/Create2
---------	---------------	-----------------	--------------	---------------------	-----------	--------------------

1.0						yes → NewCo ntract: Dividen dTracke r
-----	--	--	--	--	--	--



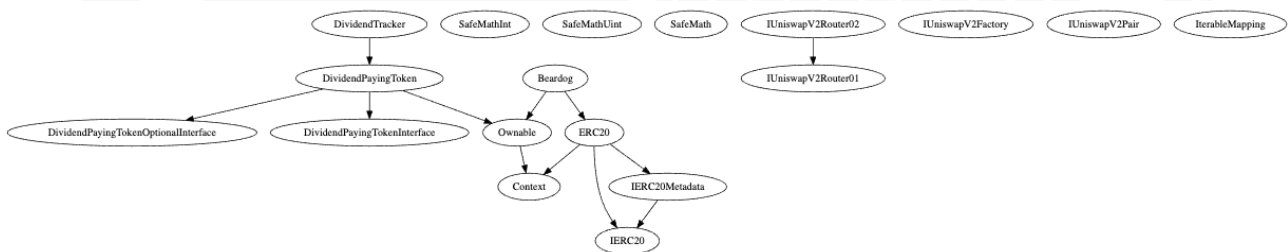
Scope of Work

The above token Team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract (usual the same name as team appended with .sol).

We will verify the following claims:

1. Correct implementation of Token standard
2. Deployer cannot mint any new tokens
3. Deployer cannot burn or lock user funds
4. Deployer cannot pause the contract
5. Overall checkup (Smart Contract Security)

Inheritance Graph v1.0



Verify Claims

Correct implementation of Token standard

Tested	Verified
✓	✓

Function	Description	Exist	Tested	Verified
TotalSupply	provides information about the total token supply	✓	✓	✓
BalanceOf	provides account balance of the owner's account	✓	✓	✓
Transfer	executes transfers of a specified number of tokens to a specified address	✓	✓	✓
TransferFrom	executes transfers of a specified number of tokens from a specified address	✓	✓	✓
Approve	allow a spender to withdraw a set number of tokens from a specified account	✓	✓	✓
Allowance	returns a set number of tokens from a spender to the owner	✓	✓	✓

Write functions of contract

addPresaleAddressForExclu...	setAutomatedMarketMakerP...
airdropToWallets	setRewardToken
approve	setRewardTokenWithCusto...
buyBackTokensWithNoFees	setWhiteListAMM
claim	setWhitelistToken
buyBackTokens	transfer
decreaseAllowance	transferFrom
enableTrading	transferOwnership
excludeFromDividends	unsetRewardToken
excludeFromFees	updateBuyFees
excludeMultipleAccountsFro...	updateCharityAmount
includeInDividends	updateCharityWallet
increaseAllowance	updateClaimWait
processDividendTracker	updateDividendTracker
renounceOwnership	updateDividendUniswapV2R...
	updateGasForProcessing
	updateLiquidityWallet
	updateOperationsWallet
	updateSellFees
	updateShibbyWallet
	updateSwapEnabled
	updateSwapTokensAtAmount
	updateUniswapV2Router

Deployer cannot mint any new tokens

Name	Exist	Tested	Verified
Deployer cannot mint	✓	✓	✓

Max/Total Supply: 1.000.000.000.000.000

Comments:

v1.0

- `_setBalance` function (line: 1036) add/sub tokens



Deployer cannot burn or lock user funds

Name	Exist	Tested	Verified
Deployer cannot lock	✓	✓	✓
Deployer cannot burn	✓	✓	✓

Comments:

v1.0

- `_setBalance` function (line: 1036) add/sub tokens

Deployer cannot pause the contract

Name	Exist	Tested	Verified
Deployer cannot pause	—	—	—



Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

Legend

Attribute	Symbol
Verified / Checked	✓
Partly Verified	⚠
Unverified / Not checked	✗
Not available	—

Modifiers

OnlyOwner

```
setWhiteListAMM
enableTrading
updateSwapEnabled
updateSwapTokensAtAmount
updateDividendTracker
updateUniswapV2Router
updateDividendUniswapV2Router
excludeFromFees
excludeMultipleAccountsFromFees
excludeFromDividends
includeInDividends
setAutomatedMarketMakerPair
airdropToWallets
updateLiquidityWallet
updateOperationsWallet
updateCharityWallet
updateShibbyWallet
updateBuyFees
updateSellFees
updateGasForProcessing
updateClaimWait
setWhitelistToken

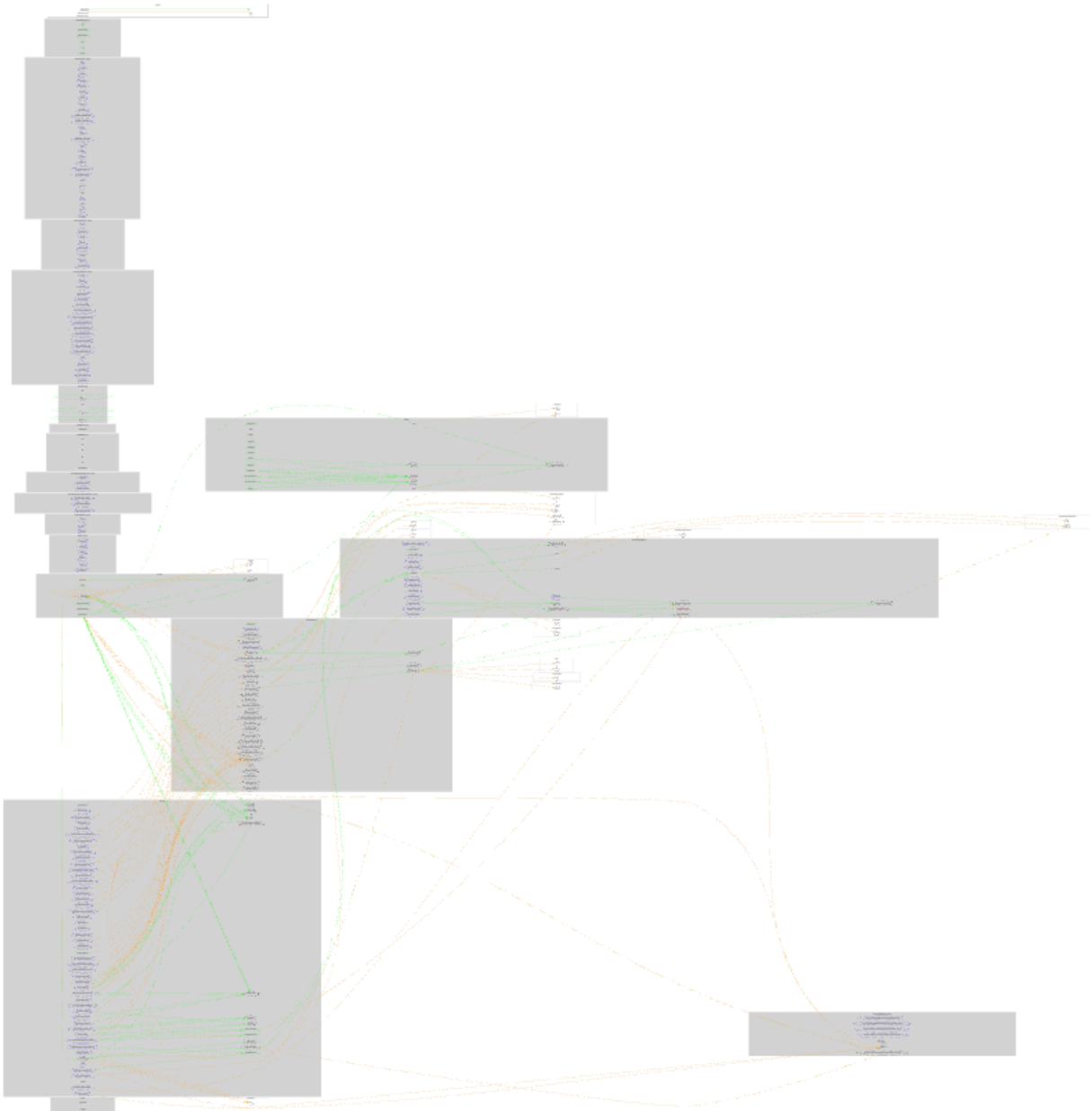
addPresaleAddressForExclusions

buyBackTokens
```

Comments






- Deployer can enable/disable following state variables
 - swapEnabled

CallGraph



Source Units in Scope

v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	contracts/Beardog.sol	10	8	2237	1860	1063	568	1031	
	contracts/IterableMapping.sol	1	—	62	62	47	4	19	—
	Totals	11	8	2299	1922	1110	572	1050	

Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
nSLOC	normalized source lines of code (only source-code lines; no comments, no blank lines)
Comment Lines	lines containing single or block comments
Complexity Score	a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

Audit Results

AUDIT PASSED

Critical issues

- no critical issues found -

High issues

- no high issues found -

Medium issues

Issue	File	Type	Line	Description
#1	Main	Reentrancy vulnerabilities	1782	Apply the [`check-effects-interactions pattern`](http://solidity.readthedocs.io/en/v0.4.21/security-considerations.html#re-entrancy).or nonReentrant modifier from OpenZeppelin

Low issues

Issue	File	Type	Line	Description
#1	Main	Contract doesn't import npm packages from source (like OpenZeppelin etc.)	-	We recommend to import all packages from npm directly without flatten the contract. Functions could be modified or can be susceptible to vulnerabilities
#2	Main	Missing Zero Address Validation (missing-zero-check)	1538, 1544, 865	Check that the address is not zero
#3	Main	State variable visibility is not set	759	It is best practice to set the visibility of state variables explicitly

Informational issues

Issue	File	Type	Line	Description
-------	------	------	------	-------------

#1	Main	State variables that could be declared constant (constable-states)	759	Add the `constant` attributes to state variables that never change
#2	Main	Unused return values	1937	Ensure that all the return values of the function calls are used and handle both success and failure cases if needed by the business logic
#3	Main	Functions that are not used	21, 681, 435, 451, 290	Remove unused functions
#4	Main	Unused state variables	244	Remove unused state variables
#5	Main	Local variable shadowing	1382, 1013, 989, 996, 1003	Rename the local variables that shadow another component
#6	Main	distributeDividends function	928	Function is not distributing, it is only calculating magnifiedDividendPerShare

Audit Comments

21. December 2021:

- Deployer can airdrop to wallets without any limitations with `airdropToWallets` function
- Read whole report for more information

SWC Attacks

ID	Title	Relationships	Status
SW C-1 36	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
SW C-1 35	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
SW C-1 34	Message call with hardcoded gas amount	CWE-655: Improper Initialization	PASSED
SW C-1 33	Hash Collisions With Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
SW C-1 32	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
SW C-1 31	Presence of unused variables	CWE-1164: Irrelevant Code	NOT PASSED
SW C-1 30	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
SW C-1 29	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED
SW C-1 28	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	PASSED

SW C-1 27	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	PASSED
SW C-1 25	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	PASSED
SW C-1 24	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	PASSED
SW C-1 23	Requirement Violation	CWE-573: Improper Following of Specification by Caller	PASSED
SW C-1 22	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	PASSED
SW C-1 21	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	PASSED
SW C-1 20	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	PASSED
SW C-11 9	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	NOT PASSED
SW C-11 8	Incorrect Constructor Name	CWE-665: Improper Initialization	PASSED
SW C-11 7	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	PASSED

SW C-11 6	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SW C-11 5	Authorization through tx.origin	CWE-477: Use of Obsolete Function	PASSED
SW C-11 4	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	PASSED
SW C-11 3	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	PASSED
SW C-11 2	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SW C-11 1	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	PASSED
SW C-11 0	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	PASSED
SW C-1 09	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	PASSED
SW C-1 08	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	NOT PASSED
SW C-1 07	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	NOT PASSED
SW C-1 06	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	PASSED

<u>SW</u> <u>C-1</u> <u>05</u>	Unprotected Ether Withdrawal	<u>CWE-284: Improper Access Control</u>	PASSED
<u>SW</u> <u>C-1</u> <u>04</u>	Unchecked Call Return Value	<u>CWE-252: Unchecked Return Value</u>	NOT PASSED
<u>SW</u> <u>C-1</u> <u>03</u>	Floating Pragma	<u>CWE-664: Improper Control of a Resource Through its Lifetime</u>	PASSED
<u>SW</u> <u>C-1</u> <u>02</u>	Outdated Compiler Version	<u>CWE-937: Using Components with Known Vulnerabilities</u>	PASSED
<u>SW</u> <u>C-1</u> <u>01</u>	Integer Overflow and Underflow	<u>CWE-682: Incorrect Calculation</u>	PASSED
<u>SW</u> <u>C-1</u> <u>00</u>	Function Default Visibility	<u>CWE-710: Improper Adherence to Coding Standards</u>	PASSED

The logo features the word "SolidProofed" in a white, handwritten-style script. The "P" is particularly large and stylized, with a long horizontal stroke that extends to the left. The background is a solid blue color with a faint, large shield emblem. The shield has a grid-like pattern on its right side and a solid blue area on its left side.

SolidProofed

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A small horizontal bar representing the German flag, with black, red, and gold stripes.

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