ExVul

SMART CONTRACT AUDIT REPORT

bitget7702 Smart Contract

April 2025

Contents

1. EXECUTIVE SUMMARY

Exvul Web3 Security was engaged by **bitget7702** to review smart contract implementation. The assessment was conducted in accordance with our systematic approach to evaluate potential security issues based upon customer requirement. The report provides detailed recommendations to resolve the issue and provide additional suggestions or recommendations for improvement.

The outcome of the assessment outlined in chapter 3 provides the system's owners a full description of the vulnerabilities identified, the associated risk rating for each vulnerability, and detailed recommendations that will resolve the underlying technical issue.

1.1 Methodology

To standardize the evaluation, we define the following terminology based on OWASP Risk Rating Methodology [10] which is the gold standard in risk assessment using the following risk models:

- Likelihood: represents how likely a particular vulnerability is to be uncovered and exploited in the wild.
- Impact: measures the technical loss and business damage of a successful attack.
- Severity: determine the overall criticality of the risk.

Likelihood can be: High, Medium and Low and impact are categorized into for: High, Medium, Low, Informational. Severity is determined by likelihood and impact and can be classified into five categories accordingly, Critical, High, Medium, Low, Informational shown in table 1.1.

		IMPACT			
		Informational	Low	Medium	High
Likelihood	High	INFO	MEDIUM	HIGH	CRITICAL
	Medium	INFO	LOW	MEDIUM	HIGH
	Low	INFO	LOW	LOW	MEDIUM

Table 1.1 Overall Risk Severity

To evaluate the risk, we will be going through a list of items, and each would be labelled with a severity category. The audit was performed with a systematic approach guided by a comprehensive assessment list carefully designed to identify known and impactful security issues. If our tool or analysis does not identify any issue, the contract can be considered safe regarding the assessed item. For any discovered issue, we might further deploy contracts on our private test environment and run tests to confirm the findings. If necessary, we would additionally build a PoC to demonstrate the possibility of exploitation. The concrete list of check items is shown in Table 1.2.

- Basic Coding Bugs: We first statically analyze given smart contracts with our proprietary static code analyzer for known coding bugs, and then manually verify (reject or confirm) all the issues found by our tool.
- Code and business security testing: We further review business logics, examine system operations, and place DeFi-related aspects under scrutiny to uncover possible pitfalls and/or bugs.
- Additional Recommendations: We also provide additional suggestions regarding the coding and development of smart contracts from the perspective of proven programming practices.

Category	Assessment Item
Basic Coding Assessment	Apply Verification Control
	Authorization Access Control
	Forged Transfer Vulnerability
	Forged Transfer Notification
	Numeric Overflow
	Transaction Rollback Attack
	Transaction Block Stuffing Attack
	Soft Fail Attack
	Hard Fail Attack
	Abnormal Memo
	Abnormal Resource Consumption
	Secure Random Number
Advanced Source Code Scrutiny	Asset Security
	Cryptography Security
	Business Logic Review
	Source Code Functional Verification
	Account Authorization Control
	Sensitive Information Disclosure
	Circuit Breaker
	Blacklist Control
	System API Call Analysis
	Contract Deployment Consistency Check
	Abnormal Resource Consumption

Additional Recommendations	Semantic Consistency Checks
	Following Other Best Practices

Table 1.2: The Full List of Assessment Items

To better describe each issue we identified, we categorize the findings with Common Weakness Enumeration (CWE-699) [14], which is a community-developed list of software weakness types to better delineate and organize weaknesses around concepts frequently encountered in software development.

2. FINDINGS OVERVIEW

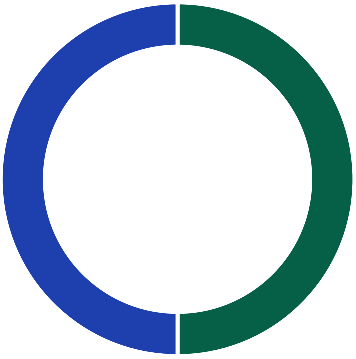
2.1 Project Info And Contract Address

ProjectName	AuditTime	Language
bitget7702	April 17 2025–April 28 2025	solidity

Soure code	Link
bitget7702	https://github.com/bitgetwallet/bgw7702
Commit Hash	6ee87c16c33ba157d89c11184cfcf48725704006

2.2 Summary

Severity	Found
CRITICAL	0
HIGH	0
MEDIUM	0
LOW	1
INFO	1



2.3 Key Findings

Severity	Findings Title	Status
LOW	Non-compliance with ERC-4337 Signature Validation	Acknowledge
INFO	Spelling Mistake in Parameter Name	Fixed

Table 2.3: Key Audit Findings

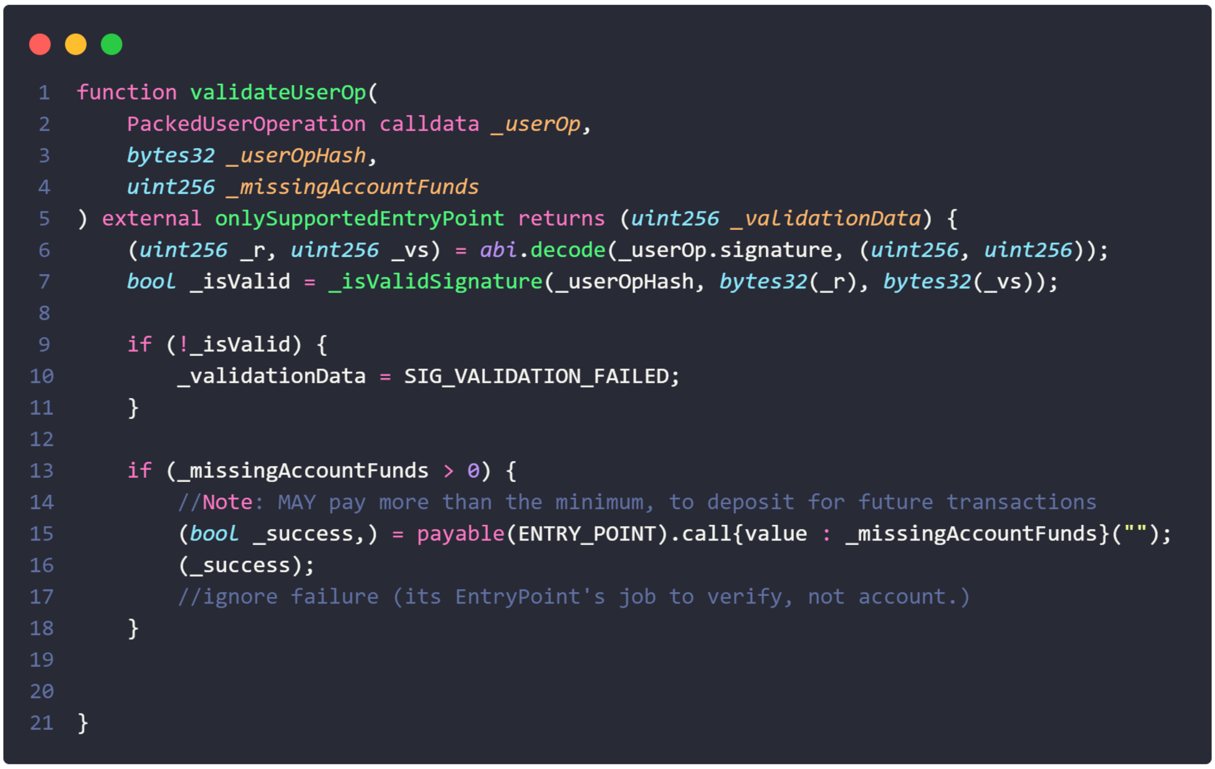
3. DETAILED DESCRIPTION OF FINDINGS

3.1 Non-compliance with ERC-4337 Signature Validation

Location	Severity	Category
BW7702Logic.sol	LOW	Standards Compliance

Description:

In the BW7702Logic.sol contract, the validateUserOp function handles signature verification but does not fully comply with the ERC-4337 specification. According to the ERC-4337 standard, if the signature is invalid, the contract SHOULD return SIG_VALIDATION_FAILED (1) without reverting, while any other errors MUST revert.



```
function validateUserOp(
    PackedUserOperation calldata _userOp,
    bytes32 _userOpHash,
    uint256 _missingAccountFunds
) external onlySupportedEntryPoint returns (uint256 _validationData) {
    (uint256 _r, uint256 _vs) = abi.decode(_userOp.signature, (uint256, uint256));
    bool _isValid = _isValidSignature(_userOpHash, bytes32(_r), bytes32(_vs));

    if (!_isValid) {
        _validationData = SIG_VALIDATION_FAILED;
    }

    if (_missingAccountFunds > 0) {
        //Note: MAY pay more than the minimum, to deposit for future transactions
        (bool _success,) = payable(ENTRY_POINT).call{value : _missingAccountFunds}("");
        (_success);
        //ignore failure (its EntryPoint's job to verify, not account.)
    }


}
```

Recommendations:

Add an early return statement after setting SIG_VALIDATION_FAILED to prevent the function from continuing execution when the signature is invalid.

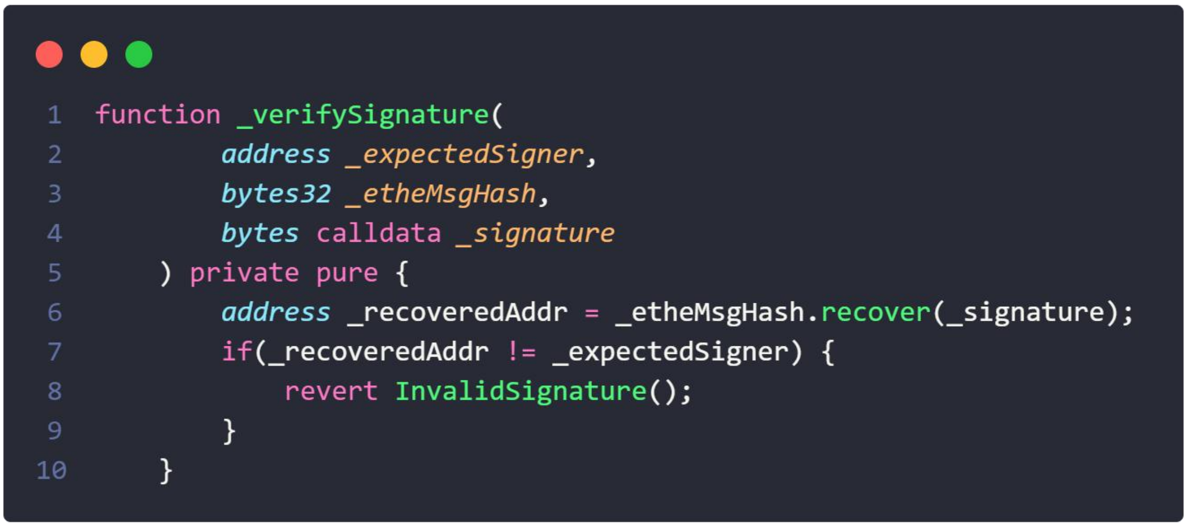
Result	FixResult
Confirmed	Acknowledge

3.2 Spelling Mistake in Parameter Name

Location	Severity	Category
BW7702Admin.sol	**INFO**	Code Quality

Description:

In the _verifySignature function of the UserAccount.sol contract, the parameter name _etheMsgHash contains a spelling mistake. The intended name appears to be _ethMsgHash, referring to the Ethereum message hash. Misspelled identifiers can lead to confusion, reduce code readability, and may be misleading to auditors and developers.



```
function _verifySignature(
        address _expectedSigner,
        bytes32 _etheMsgHash,
        bytes calldata _signature
    ) private pure {
        address _recoveredAddr = _etheMsgHash.recover(_signature);
        if(_recoveredAddr != _expectedSigner) {
            revert InvalidSignature();
        }
    }
```

Recommendations:

Rename the parameter _etheMsgHash to _ethMsgHash to correct the spelling and improve code clarity.

Result	FixResult
Confirmed	Fixed

4. CONCLUSION

In this audit, we thoroughly analyzed **bitget7702** smart contract implementation. The problems found are described and explained in detail in Section 3. The problems found in the audit have been communicated to the project leader. We therefore consider the audit result to be **PASSED**. To improve this report, we greatly appreciate any constructive feedbacks or suggestions, on our methodology, audit findings, or potential gaps in scope/coverage.

5. APPENDIX

5.1 Basic Coding Assessment

5.1.1 Apply Verification Control

Description	The security of apply verification
Result	Not found
Severity	CRITICAL

5.1.2 Authorization Access Control

Description	Permission checks for external integral functions
Result	Not found
Severity	CRITICAL

5.1.3 Forged Transfer Vulnerability

Description	Assess whether there is a forged transfer notification vulnerability in the contract
Result	Not found
Severity	CRITICAL

5.1.4 Transaction Rollback Attack

Description	Assess whether there is transaction rollback attack vulnerability in the contract
Result	Not found
Severity	CRITICAL

5.1.5 Transaction Block Stuffing Attack

Description	Assess whether there is transaction blocking attack vulnerability
Result	Not found
Severity	CRITICAL

5.1.6 Soft Fail Attack Assessment

Description	Assess whether there is soft fail attack vulnerability
Result	Not found
Severity	CRITICAL

5.1.7 Hard Fail Attack Assessment

Description	Examine for hard fail attack vulnerability
Result	Not found
Severity	CRITICAL

5.1.8 Abnormal Memo Assessment

Description	Assess whether there is abnormal memo vulnerability in the contract
Result	Not found
Severity	CRITICAL

5.1.9 Abnormal Resource Consumption

Description	Examine whether abnormal resource consumption in contract processing
Result	Not found
Severity	CRITICAL

5.1.10 Random Number Security

Description	Examine whether the code uses insecure random number
Result	Not found
Severity	CRITICAL

5.2 Advanced Code Scrutiny

5.2.1 Cryptography Security

Description	Examine for weakness in cryptograph implementation
Result	Not found
Severity	HIGH

5.2.2 Account Permission Control

Description	Examine permission control issue in the contract
Result	Not found
Severity	MEDIUM

5.2.3 Malicious Code Behavior

Description	Examine whether sensitive behavior present in the code
Result	Not found
Severity	MEDIUM

5.2.4 Sensitive Information Disclosure

Description	Examine whether sensitive information disclosure issue present in the code
Result	Not found
Severity	MEDIUM

5.2.5 System API

Description	Examine whether system API application issue present in the code
Result	Not found
Severity	LOW

6. DISCLAIMER

This report is subject to the terms and conditions (including without limitation, description of services, confidentiality, disclaimer and limitation of liability) set forth in the Services Agreement, or the scope of services, and terms and conditions provided to the Company in connection with the Agreement. This report provided in connection with the Services set forth in the Agreement shall be used by the Company only to the extent permitted under the terms and conditions set forth in the Agreement. This report may not be transmitted, disclosed, referred to or relied upon by any person for any purposes without ExVul's prior written consent.

This report is not, nor should be considered, an "endorsement" or "disapproval" of any particular project or team. This report is not, nor should be considered, an indication of the economics or value of any "product" or "asset" created by any team or project that contracts ExVul to perform a security assessment. This report does not provide any warranty or guarantee regarding the absolute bug-free nature of the technology analyzed, nor do they provide any indication of the technologies proprietors, business, business model or legal compliance.

This report should not be used in any way to make decisions around investment or involvement with any particular project. This report in no way provides investment advice, nor should be leveraged as investment advice of any sort. This report represents an extensive assessing process intending to help our customers increase the quality of their code while reducing the high level of risk presented by cryptographic tokens and blockchain technology.

Blockchain technology and cryptographic assets present a high level of ongoing risk. ExVul's position is that each company and individual are responsible for their own due diligence and continuous security. ExVul'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.

7. REFERENCES

[1] MITRE. CWE- 191: Integer Underflow (Wrap or Wraparound).

https://cwe.mitre.org/data/ definitions/191.html.

[2] MITRE. CWE- 197: Numeric Truncation Error.

https://cwe.mitre.org/data/definitions/197. html.

[3] MITRE. CWE-400: Uncontrolled Resource Consumption.

https://cwe.mitre.org/data/ definitions/400.html.

[4] MITRE. CWE-440: Expected Behavior Violation.

https://cwe.mitre.org/data/definitions/440. html.

[5] MITRE. CWE-684: Protection Mechanism Failure.

https://cwe.mitre.org/data/definitions/ 693.html.

[6] MITRE. CWE CATEGORY: 7PK - Security Features.

https://cwe.mitre.org/data/definitions/ 254.html.

[7] MITRE. CWE CATEGORY: Behavioral Problems.

https://cwe.mitre.org/data/definitions/438. html.

[8] MITRE. CWE CATEGORY: Numeric Errors.

https://cwe.mitre.org/data/definitions/189.html.

[9] MITRE. CWE CATEGORY: Resource Management Errors.

https://cwe.mitre.org/data/ definitions/399.html.

[10] OWASP. Risk Rating Methodology.

https://www.owasp.org/index.php/OWASP_Risk_Rating_Methodology

Contact

Website

www.exvul.com

Email

contact@exvul.com

Twitter

@EXVULSEC

Github

github.com/EXVUL-Sec

ExVul