Armors Labs

Token MAP Network (MAP)

Smart Contract Audit

Token MAP Network (MAP) Audit Summary

Project name : Token MAP Network (MAP) Contract

Project address: None

Code URL : https://polygonscan.com/token/0x80DAD5C3985aEF54c368F64230CA07768f11C8f6#code

Commit : None

Project target : Token MAP Network (MAP) Contract Audit

Blockchain : Polygon

Test result : PASSED

Audit Info

Audit NO : 0X202505130006

Audit Team : Armors Labs

Audit Proofreading: https://armors.io/#project-cases

Token MAP Network (MAP) Audit

The Token MAP Network (MAP) team asked us to review and audit their Token MAP Network (MAP) contract. We looked at the code and now publish our results.

Here is our assessment and recommendations, in order of importance.

Document information

Name	Auditor	Version	Date
Token MAP Network (MAP) Audit	Rock, Sophia, Rushairer, Rico, David, Alice	1.0.0	2025-05-13

Audit results

Warning: The contract allows for unlimited token minting.

Note that as of the date of publishing, the above review reflects the current understanding of known security patterns as they relate to the Token MAP Network (MAP) contract. The above should not be construed as investment advice.

Based on the widely recognized security status of the current underlying blockchain and smart contract, this audit report is valid for 3 months from the date of output.

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Audited target file

file	md5
./MAPNetwork.sol	939bafe7581c386efa5abce45f7ad3d8

Vulnerability analysis

Vulnerability distribution

vulnerability level	number
Critical severity	0
High severity	0
Medium severity	0
Low severity	0

Summary of audit results

Vulnerability	status
Re-Entrancy	safe
Arithmetic Over/Under Flows	safe
Unexpected Blockchain Currency	safe
Delegatecall	safe
Default Visibilities	safe
Entropy Illusion	safe
External Contract Referencing	safe
Short Address/Parameter Attack	safe
Unchecked CALL Return Values	safe
Race Conditions / Front Running	safe

Vulnerability	status
Denial Of Service (DOS)	safe
Block Timestamp Manipulation	safe
Constructors with Care	safe
Unintialised Storage Pointers	safe
Floating Points and Numerical Precision	safe
tx.origin Authentication	safe
Permission restrictions	safe

Contract file

```
/**
 *Submitted for verification at polygonscan.com on 2025-02-19
*/

// SPDX-License-Identifier: MIT

pragma solidity ^0.8.0;

abstract contract Context {
    function _msgSender() internal view virtual returns (address) {
        return msg.sender;
    }

    function _msgData() internal view virtual returns (bytes calldata) {
        this;
        return msg.data;
    }
}


pragma solidity ^0.8.0;

abstract contract Ownable is Context {
    address private _owner;

    event OwnershipTransferred(address indexed previousOwner, address indexed newOwner);

    constructor () {
        address msgSender = _msgSender();
        _owner = msgSender;
        emit OwnershipTransferred(address(0), msgSender);
    }

    function owner() public view virtual returns (address) {
        return _owner;
    }

    modifier onlyOwner() {
        require(owner() == _msgSender(), "Ownable: caller is not the owner");
        _;
    }

    function renounceOwnership() public virtual onlyOwner {
        emit OwnershipTransferred(_owner, address(0));
```

```
            _owner = address(0);
        }

        function transferOwnership(address newOwner) public virtual onlyOwner {
            require(newOwner != address(0), "Ownable: new owner is the zero address");
            emit OwnershipTransferred(_owner, newOwner);
            _owner = newOwner;
        }
    }


    pragma solidity ^0.8.0;

    interface IBEP20 {

        function name() external view returns (string memory);

        function symbol() external view returns (string memory);

        function decimals() external view returns (uint8);

        function totalSupply() external view returns (uint256);

        function balanceOf(address account) external view returns (uint256);

        function getOwner() external view returns (address);

        function transfer(address recipient, uint256 amount) external returns (bool);

        function transferFrom(address sender, address recipient, uint256 amount) external returns (bool);

        function approve(address spender, uint256 amount) external returns (bool);

        function allowance(address _owner, address spender) external view returns (uint256);

        event Transfer(address indexed from, address indexed to, uint256 value);

        event Approval(address indexed owner, address indexed spender, uint256 value);
    }


    pragma solidity ^0.8.0;

    contract BEP20 is Ownable, IBEP20 {
        mapping (address => uint256) private _balances;

        mapping (address => mapping (address => uint256)) private _allowances;

        uint256 private _totalSupply;

        string private _name;
        string private _symbol;
        uint8 private _decimals;

        constructor (string memory name_, string memory symbol_) {
            _name = name_;
            _symbol = symbol_;
            _decimals = 18;
        }

        function name() public view override returns (string memory) {
            return _name;
        }

        function symbol() public view override returns (string memory) {
            return _symbol;
```

```
    }

    function decimals() public view override returns (uint8) {
        return _decimals;
    }

    function totalSupply() public view override returns (uint256) {
        return _totalSupply;
    }

    function balanceOf(address account) public view override returns (uint256) {
        return _balances[account];
    }

    function getOwner() public view override returns (address) {
        return owner();
    }

    function transfer(address recipient, uint256 amount) public virtual override returns (bool) {
        _transfer(_msgSender(), recipient, amount);
        return true;
    }

    function transferFrom(address sender, address recipient, uint256 amount) public virtual override
        _transfer(sender, recipient, amount);

        uint256 currentAllowance = _allowances[sender][_msgSender()];
        require(currentAllowance >= amount, "BEP20: transfer amount exceeds allowance");
        _approve(sender, _msgSender(), currentAllowance - amount);

        return true;
    }

    function approve(address spender, uint256 amount) public virtual override returns (bool) {
        _approve(_msgSender(), spender, amount);
        return true;
    }

    function allowance(address owner, address spender) public view virtual override returns (uint256)
        return _allowances[owner][spender];
    }

    function increaseAllowance(address spender, uint256 addedValue) public virtual returns (bool) {
        _approve(_msgSender(), spender, _allowances[_msgSender()][spender] + addedValue);

        return true;
    }

    function decreaseAllowance(address spender, uint256 subtractedValue) public virtual returns (bool
        uint256 currentAllowance = _allowances[_msgSender()][spender];

        require(currentAllowance >= subtractedValue, "BEP20: decreased allowance below zero");

        _approve(_msgSender(), spender, currentAllowance - subtractedValue);

        return true;
    }

    function _transfer(address sender, address recipient, uint256 amount) internal virtual {
        require(sender != address(0), "BEP20: transfer from the zero address");

        require(recipient != address(0), "BEP20: transfer to the zero address");

        _beforeTokenTransfer(sender, recipient, amount);

        uint256 senderBalance = _balances[sender];
```

```
        require(senderBalance >= amount, "BEP20: transfer amount exceeds balance");

        _balances[sender] = senderBalance - amount;
        _balances[recipient] += amount;

        emit Transfer(sender, recipient, amount);
    }

    function _mint(address account, uint256 amount) internal virtual {
        require(account != address(0), "BEP20: mint to the zero address");

        _beforeTokenTransfer(address(0), account, amount);

        _totalSupply += amount;
        _balances[account] += amount;

        emit Transfer(address(0), account, amount);
    }

    function _burn(address account, uint256 amount) internal virtual {
        require(account != address(0), "BEP20: burn from the zero address");

        _beforeTokenTransfer(account, address(0), amount);

        uint256 accountBalance = _balances[account];

        require(accountBalance >= amount, "BEP20: burn amount exceeds balance");

        _balances[account] = accountBalance - amount;
        _totalSupply -= amount;

        emit Transfer(account, address(0), amount);
    }

    function _approve(address owner, address spender, uint256 amount) internal virtual {
        require(owner != address(0), "BEP20: approve from the zero address");
        require(spender != address(0), "BEP20: approve to the zero address");

        _allowances[owner][spender] = amount;
        emit Approval(owner, spender, amount);
    }

    function _setupDecimals(uint8 decimals_) internal {
        _decimals = decimals_;
    }

    function _beforeTokenTransfer(address from, address to, uint256 amount) internal virtual { }
}


pragma solidity ^0.8.0;

abstract contract BEP20Burnable is BEP20 {

    function burn(uint256 amount) public virtual onlyOwner {
        _burn(_msgSender(), amount);
    }

}

pragma solidity ^0.8.0;

abstract contract BEP20Mintable is BEP20 {

    function mint(uint256 amount) public virtual onlyOwner {
```

```
        _mint(_msgSender(), amount);
    }

}


pragma solidity ^0.8.0;

contract MAPNetwork is BEP20Burnable, BEP20Mintable {

    constructor ()
        BEP20("MAP Network", "MAP")
    {
        uint8 decimals = 18;
        uint256 initialBalance = 1000000000 * 10 ** decimals;
        _setupDecimals(decimals);
        _mint(_msgSender(), initialBalance);
    }
}
```

Analysis of audit results

Re-Entrancy

- **Description:**
  One of the features of smart contracts is the ability to call and utilise code of other external contracts. Contracts also typically handle Blockchain Currency, and as such often send Blockchain Currency to various external user addresses. The operation of calling external contracts, or sending Blockchain Currency to an address, requires the contract to submit an external call. These external calls can be hijacked by attackers whereby they force the contract to execute further code (i.e. through a fallback function) , including calls back into itself. Thus the code execution "re-enters" the contract. Attacks of this kind were used in the infamous DAO hack.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
  no.

Arithmetic Over/Under Flows

- **Description:**
  The Virtual Machine (EVM) specifies fixed-size data types for integers. This means that an integer variable, only has a certain range of numbers it can represent. A uint8 for example, can only store numbers in the range [0,255]. Trying to store 256 into a uint8 will result in 0. If care is not taken, variables in Solidity can be exploited if user input is unchecked and calculations are performed which result in numbers that lie outside the range of the data type that stores them.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
  no.

Unexpected Blockchain Currency

- **Description:**
  Typically when Blockchain Currency is sent to a contract, it must execute either the fallback function, or another function described in the contract. There are two exceptions to this, where Blockchain Currency can exist in a contract without having executed any code. Contracts which rely on code execution for every Blockchain Currency sent to the contract can be vulnerable to attacks where Blockchain Currency is forcibly sent to a contract.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:** no.

Delegatecall

- **Description:**
  The CALL and DELEGATECALL opcodes are useful in allowing developers to modularise their code. Standard external message calls to contracts are handled by the CALL opcode whereby code is run in the context of the external contract/function. The DELEGATECALL opcode is identical to the standard message call, except that the code executed at the targeted address is run in the context of the calling contract along with the fact that msg.sender and msg.value remain unchanged. This feature enables the implementation of libraries whereby developers can create reusable code for future contracts.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:** no.

Default Visibilities

- **Description:**
  Functions in Solidity have visibility specifiers which dictate how functions are allowed to be called. The visibility determines whBlockchain Currency a function can be called externally by users, by other derived contracts, only internally or only externally. There are four visibility specifiers, which are described in detail in the Solidity Docs. Functions default to public allowing users to call them externally. Incorrect use of visibility specifiers can lead to some devestating vulnerabilities in smart contracts as will be discussed in this section.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
  no.

Entropy Illusion

- **Description:**
  All transactions on the blockchain are deterministic state transition operations. Meaning that every transaction modifies the global state of the ecosystem and it does so in a calculable way with no uncertainty. This ultimately means that inside the blockchain ecosystem there is no source of entropy or randomness. There is no rand()

function in Solidity. Achieving decentralised entropy (randomness) is a well established problem and many ideas have been proposed to address this (see for example, RandDAO or using a chain of Hashes as described by Vitalik in this post).

- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
no.

External Contract Referencing

- **Description:**
One of the benefits of the global computer is the ability to re-use code and interact with contracts already deployed on the network. As a result, a large number of contracts reference external contracts and in general operation use external message calls to interact with these contracts. These external message calls can mask malicious actors intentions in some non-obvious ways, which we will discuss.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
no.

Unsolved TODO comments

- **Description:**
Check for Unsolved TODO comments
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
no.

Short Address/Parameter Attack

- **Description:**
This attack is not specifically performed on Solidity contracts themselves but on third party applications that may interact with them. I add this attack for completeness and to be aware of how parameters can be manipulated in contracts.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
no.

Unchecked CALL Return Values

- **Description:**
There a number of ways of performing external calls in solidity. Sending Blockchain Currency to external accounts is commonly performed via the transfer() method. However, the send() function can also be used and, for more versatile external calls, the CALL opcode can be directly employed in solidity. The call() and send() functions return a boolean indicating if the call succeeded or failed. Thus these functions have a simple caveat, in that the transaction that executes these functions will not revert if the external call (intialised by call() or send()) fails, rather the call() or send() will simply return false. A common pitfall arises when the return value is not checked, rather the developer expects a revert to occur.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
no.

Race Conditions / Front Running

- **Description:**
The combination of external calls to other contracts and the multi-user nature of the underlying blockchain gives rise to a variety of potential Solidity pitfalls whereby users race code execution to obtain unexpected states. Re-Entrancy is one example of such a race condition. In this section we will talk more generally about different kinds of race conditions that can occur on the blockchain. There is a variety of good posts on this subject, a few are: Wiki - Safety, DASP - Front-Running and the Consensus - Smart Contract Best Practices.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
no.

Denial Of Service (DOS)

- **Description:**
This category is very broad, but fundamentally consists of attacks where users can leave the contract inoperable for a small period of time, or in some cases, permanently. This can trap Blockchain Currency in these contracts forever, as was the case with the Second Parity MultiSig hack
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
no.

Block Timestamp Manipulation

- **Description:**
Block timestamps have historically been used for a variety of applications, such as entropy for random numbers (see the Entropy Illusion section for further details), locking funds for periods of time and various state-changing conditional statements that are time-dependent. Miner's have the ability to adjust timestamps slightly which can prove to be quite dangerous if block timestamps are used incorrectly in smart contracts.

- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
  no.

Constructors with Care

- **Description:**
  Constructors are special functions which often perform critical, privileged tasks when initialising contracts. Before solidity v0.4.22 constructors were defined as functions that had the same name as the contract that contained them. Thus, when a contract name gets changed in development, if the constructor name isn't changed, it becomes a normal, callable function. As you can imagine, this can (and has) lead to some interesting contract hacks.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
  no.

Unintialised Storage Pointers

- **Description:**
  The EVM stores data either as storage or as memory. Understanding exactly how this is done and the default types for local variables of functions is highly recommended when developing contracts. This is because it is possible to produce vulnerable contracts by inappropriately intialising variables.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
  no.

Floating Points and Numerical Precision

- **Description:**
  As of this writing (Solidity v0.4.24), fixed point or floating point numbers are not supported. This means that floating point representations must be made with the integer types in Solidity. This can lead to errors/vulnerabilities if not implemented correctly.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
  no.

tx.origin Authentication

- **Description:**
  Solidity has a global variable, tx.origin which traverses the entire call stack and returns the address of the account that originally sent the call (or transaction). Using this variable for authentication in smart contracts leaves the contract vulnerable to a phishing-like attack.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
  no.

Permission restrictions

- **Description:**
  Contract managers who can control liquidity or pledge pools, etc., or impose unreasonable restrictions on other users.
- **Detection results:**

```
PASSED!
```

- **Security suggestion:**
  no.

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