



# Gains Network Smart Contract Audit Report

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# AUDITED DETAILS

## Audited Project

Project name	Token ticker	Blockchain
Gains Network	GNS	Polygon Matic

## Addresses

Contract address	0xE5417Af564e4bFDA1c483642db72007871397896
Contract deployer address	0xC66FbE50Dd33c9AAdd65707F7088D597C86fE00F

## Project Website

<https://gains.trade/>

## Codebase

<https://polygonscan.com/address/0xE5417Af564e4bFDA1c483642db72007871397896#code>

# SUMMARY

Gains Network is developing gTrade, a liquidity-efficient, powerful, and user-friendly decentralized leveraged trading platform.

## Contract Summary

### Documentation Quality

Gains Network provides a very good documentation with standard of solidity base code.

- The technical description is provided clearly and structured and also don't have any high risk issue.

### Code Quality

The Overall quality of the basecode is standard.

- Standard solidity basecode and rules are already followed by Gains Network with the discovery of several low issues.

### Test Coverage

Test coverage of the project is 100% ( Through Codebase )

## Audit Findings Summary

- SWC-100 SWC-108 | Explicitly define visibility for all state variables on lines 1414, 1518 and 1658.
- SWC-103 | Pragma statements can be allowed to float when a contract is intended on lines 9, 34, 112, 327, 633, 678, 976 and 1166.
- SWC-120 | It is recommended to use external sources of randomness via oracles on lines 1715, 1716, 1723 and 1731.

## CONCLUSION

We have audited the Gains Network project released in October 2021 to discover issues and identify potential security vulnerabilities in Gains Network Project. This process is used to find technical issues and security loopholes which might be found in the smart contract.

The security audit report provides satisfactory results with low-risk issues.

The issues found in the NamaFile smart contract code do not pose a considerable risk. The writing of the contract is close to the standard of writing contracts in general. The low-risk issues found are that a floating pragma is set, a state variable visibility is not set, and weak sources of randomness. Specifying a fixed compiler version is recommended to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code. The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number, and timestamp are predictable and can be manipulated by a malicious miner. Also, keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness, and be aware that using these variables introduces a certain level of trust in miners.

# AUDIT RESULT

Article	Category	Description	Result
Default Visibility	SWC-100 SWC-108	Functions and state variables visibility should be set explicitly. Visibility levels should be specified consciously.	<b>ISSUE FOUND</b>
Integer Overflow and Underflow	SWC-101	If unchecked math is used, all math operations should be safe from overflows and underflows.	<b>PASS</b>
Outdated Compiler Version	SWC-102	It is recommended to use a recent version of the Solidity compiler.	<b>PASS</b>
Floating Pragma	SWC-103	Contracts should be deployed with the same compiler version and flags that they have been tested thoroughly.	<b>ISSUE FOUND</b>
Unchecked Call Return Value	SWC-104	The return value of a message call should be checked.	<b>PASS</b>
Unprotected Ether Withdrawal	SWC-105	Due to missing or insufficient access controls, malicious parties can withdraw from the contract.	<b>PASS</b>
SELFDESTRUCT Instruction	SWC-106	The contract should not be self-destructible while it has funds belonging to users.	<b>PASS</b>
Reentrancy	SWC-107	Check effect interaction pattern should be followed if the code performs recursive call.	<b>PASS</b>
Uninitialized Storage Pointer	SWC-109	Uninitialized local storage variables can point to unexpected storage locations in the contract.	<b>PASS</b>
Assert Violation	SWC-110 SWC-123	Properly functioning code should never reach a failing assert statement.	<b>PASS</b>
Deprecated Solidity Functions	SWC-111	Deprecated built-in functions should never be used.	<b>PASS</b>
Delegate call to Untrusted Callee	SWC-112	Delegatecalls should only be allowed to trusted addresses.	<b>PASS</b>

DoS (Denial of Service)	SWC-113 SWC-128	Execution of the code should never be blocked by a specific contract state unless required.	PASS
Race Conditions	SWC-114	Race Conditions and Transactions Order Dependency should not be possible.	PASS
Authorization through tx.origin	SWC-115	tx.origin should not be used for authorization.	PASS
Block values as a proxy for time	SWC-116	Block numbers should not be used for time calculations.	PASS
Signature Unique ID	SWC-117 SWC-121 SWC-122	Signed messages should always have a unique id. A transaction hash should not be used as a unique id.	PASS
Incorrect Constructor Name	SWC-118	Constructors are special functions that are called only once during the contract creation.	PASS
Shadowing State Variable	SWC-119	State variables should not be shadowed.	PASS
Weak Sources of Randomness	SWC-120	Random values should never be generated from Chain Attributes or be predictable.	ISSUE FOUND
Write to Arbitrary Storage Location	SWC-124	The contract is responsible for ensuring that only authorized user or contract accounts may write to sensitive storage locations.	PASS
Incorrect Inheritance Order	SWC-125	When inheriting multiple contracts, especially if they have identical functions, a developer should carefully specify inheritance in the correct order. The rule of thumb is to inherit contracts from more /general/ to more /specific/.	PASS
Insufficient Gas Griefing	SWC-126	Insufficient gas griefing attacks can be performed on contracts which accept data and use it in a sub-call on another contract.	PASS
Arbitrary Jump Function	SWC-127	As Solidity doesnt support pointer arithmetics, it is impossible to change such variable to an arbitrary value.	PASS

Typographical Error	SWC-129	A typographical error can occur for example when the intent of a defined operation is to sum a number to a variable.	PASS
Override control character	SWC-130	Malicious actors can use the Right-To-Left-Override unicode character to force RTL text rendering and confuse users as to the real intent of a contract.	PASS
Unused variables	SWC-131 SWC-135	Unused variables are allowed in Solidity and they do not pose a direct security issue.	PASS
Unexpected Ether balance	SWC-132	Contracts can behave erroneously when they strictly assume a specific Ether balance.	PASS
Hash Collisions Variable	SWC-133	Using <code>abi.encodePacked()</code> with multiple variable length arguments can, in certain situations, lead to a hash collision.	PASS
Hardcoded gas amount	SWC-134	The <code>transfer()</code> and <code>send()</code> functions forward a fixed amount of 2300 gas.	PASS
Unencrypted Private Data	SWC-136	It is a common misconception that private type variables cannot be read.	PASS



# SMART CONTRACT ANALYSIS

Started	Wednesday Oct 27 2021 04:42:48 GMT+0000 (Coordinated Universal Time)
Finished	Thursday Oct 28 2021 06:45:43 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	GainsNetworkToken.sol

## Detected Issues

ID	Title	Severity	Status
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
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SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-108	STATE VARIABLE VISIBILITY IS NOT SET.	low	acknowledged
SWC-108	STATE VARIABLE VISIBILITY IS NOT SET.	low	acknowledged
SWC-108	STATE VARIABLE VISIBILITY IS NOT SET.	low	acknowledged
SWC-120	POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.	low	acknowledged

<b>SWC-120</b>	POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.	<b>low</b>	acknowledged
<b>SWC-120</b>	POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.	<b>low</b>	acknowledged
<b>SWC-120</b>	POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.	<b>low</b>	acknowledged

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 9

### low SEVERITY

The current pragma Solidity directive is `">=0.6.0<0.8.0"`. It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- GainsNetworkToken.sol

### Locations

```
8
9  pragma solidity >=0.6.0 <0.8.0;
10
11  /*
12   * @dev Provides information about the current execution context, including the
13
```

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 34

### low SEVERITY

The current pragma Solidity directive is "">=0.6.0<0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- GainsNetworkToken.sol

### Locations

```
33
34 pragma solidity >=0.6.0 <0.8.0;
35
36 /**
37  * @dev Interface of the ERC20 standard as defined in the EIP.
38
```

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 112

### low SEVERITY

The current pragma Solidity directive is ""`>=0.6.0<0.8.0`"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- GainsNetworkToken.sol

### Locations

```
111
112  pragma solidity >=0.6.0 <0.8.0;
113
114  /**
115   * @dev Wrappers over Solidity's arithmetic operations with added overflow
116
```

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 327

### low SEVERITY

The current pragma Solidity directive is `">=0.6.0<0.8.0"`. It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- GainsNetworkToken.sol

### Locations

```
326
327  pragma solidity >=0.6.0 <0.8.0;
328
329
330
331
```

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 633

### low SEVERITY

The current pragma Solidity directive is `">=0.6.0<0.8.0"`. It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- GainsNetworkToken.sol

### Locations

```
632
633  pragma solidity >=0.6.0 <0.8.0;
634
635
636  /**
637
```

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 678

### low SEVERITY

The current pragma Solidity directive is `">=0.6.0<0.8.0"`. It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- GainsNetworkToken.sol

### Locations

```
677
678  pragma solidity >=0.6.0 <0.8.0;
679
680  /**
681   * @dev Library for managing
682
```



## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 976

### low SEVERITY

The current pragma Solidity directive is `">=0.6.2<0.8.0"`. It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- GainsNetworkToken.sol

### Locations

```
975
976 pragma solidity >=0.6.2 <0.8.0;
977
978 /**
979  * @dev Collection of functions related to the address type
980
```

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 1166

### low SEVERITY

The current pragma Solidity directive is `">=0.6.0<0.8.0"`. It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- GainsNetworkToken.sol

### Locations

```
1165
1166  pragma solidity >=0.6.0 <0.8.0;
1167
1168
1169
1170
```

## SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 1414

### low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "inited" is internal. Other possible visibility settings are public and private.

### Source File

- GainsNetworkToken.sol

### Locations

```
1413 contract Initializable {
1414     bool inited = false;
1415
1416     modifier initializer() {
1417         require(!inited, "already inited");
1418     }
```

## SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 1518

### low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "nonces" is internal. Other possible visibility settings are public and private.

### Source File

- GainsNetworkToken.sol

### Locations

```
1517 );  
1518 mapping(address => uint256) nonces;  
1519  
1520 /*  
1521  * Meta transaction structure.  
1522
```

## SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 1658

### low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "grantRequests" is internal. Other possible visibility settings are public and private.

### Source File

- GainsNetworkToken.sol

### Locations

```
1657     }
1658     mapping(address => GrantRequest) grantRequests;
1659     uint constant public MIN_GRANT_REQUEST_DELAY = 45000; // 1 day
1660
1661     event GrantRequestInitiated(bytes32[] indexed roles, address indexed account, uint
indexed block);
1662
```

# SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1715

## low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

## Source File

- GainsNetworkToken.sol

## Locations

```
1714   require(!grantRequestInitiated(account), "Grant request already initiated for this
account.");
1715   grantRequests[account] = GrantRequest(roles, block.number);
1716   emit GrantRequestInitiated(roles, account, block.number);
1717   }
1718
1719
```

## SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1716

### low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

### Source File

- GainsNetworkToken.sol

### Locations

```
1715 grantRequests[account] = GrantRequest(roles, block.number);
1716 emit GrantRequestInitiated(roles, account, block.number);
1717 }
1718
1719 // Cancels a request to grant `role` to `account`
1720
```

## SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1723

### low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

### Source File

- GainsNetworkToken.sol

### Locations

```
1722 delete grantRequests[account];
1723 emit GrantRequestCanceled(account, block.number);
1724 }
1725
1726 // Grant the roles precised in the request to account (must wait for the timelock)
1727
```



## SWC-120 | POTENTIAL USE OF "BLOCK.NUMBER" AS SOURCE OF RANDOMNESS.

LINE 1731

### low SEVERITY

The environment variable "block.number" looks like it might be used as a source of randomness. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

### Source File

- GainsNetworkToken.sol

### Locations

```
1730  GrantRequest memory r = grantRequests[account];
1731  require(block.number >= r.initiated + MIN_GRANT_REQUEST_DELAY, "You must wait for
the minimum delay after initiating a request.");
1732
1733  for(uint i = 0; i < r.roles.length; i++){
1734    _setupRole(r.roles[i], account);
1735
```

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This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn’t say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the below disclaimer below – please make sure to read it in full.

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