



Security Assessment

Gotabit

CertiK Verified on Dec 28th, 2022





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Gotabit

The security assessment was prepared by Certik, the leader in Web3.0 security.

Executive Summary

TYPES

DeFi

ECOSYSTEM

Cosmos (ATOM)

METHODS

Manual Review, Static Analysis

LANGUAGE

Golang

TIMELINE

Delivered on 12/28/2022

KEY COMPONENTS

N/A

CODEBASE

<https://github.com/gotabit/gotabit/tree/6d4cb352a23bb6ec337af0b35d4d4aeaf126ab8b>
...View All

COMMITTS

6d4cb352a23bb6ec337af0b35d4d4aeaf126ab8b
...View All

Vulnerability Summary



6

Total Findings

0

Resolved

0

Mitigated

0

Partially Resolved

6

Acknowledged

0

Declined

0

Unresolved



0 Critical

Critical risks are those that impact the safe functioning of a platform and must be addressed before launch. Users should not invest in any project with outstanding critical risks.



1 Major

1 Acknowledged

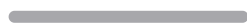


Major risks can include centralization issues and logical errors. Under specific circumstances, these major risks can lead to loss of funds and/or control of the project.



1 Medium

1 Acknowledged

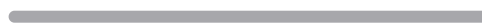


Medium risks may not pose a direct risk to users' funds, but they can affect the overall functioning of a platform.



2 Minor

2 Acknowledged

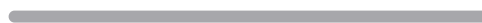


Minor risks can be any of the above, but on a smaller scale. They generally do not compromise the overall integrity of the project, but they may be less efficient than other solutions.



2 Informational

2 Acknowledged



Informational errors are often recommendations to improve the style of the code or certain operations to fall within industry best practices. They usually do not affect the overall functioning of the code.

TABLE OF CONTENTS | GOTABIT

I Summary

Executive Summary

Vulnerability Summary

Codebase

Audit Scope

Approach & Methods

I Findings

TYP-01 : Possible Issue with 0 `ReductionFactor`

PAR-01 : Incorrect Check of 'Reductionfactor'

APP-01 : Redundant code

PAR-02 : Wrong Error Message

6D4-01 : Unused Function

HOK-01 : The `TODO` Comment

I Appendix

I Disclaimer

CODEBASE | GOTABIT

Repository












<https://github.com/gotabit/gotabit/tree/6d4cb352a23bb6ec337af0b35d4d4aeaf126ab8b>


















Commit








6d4cb352a23bb6ec337af0b35d4d4aeaf126ab8b

AUDIT SCOPE | GOTABIT

38 files audited ● 5 files with Acknowledged findings ● 33 files without findings

ID	File	SHA256 Checksum
● APP	 app/app.go	6916aa6aa01f8255507b2b5e7d031cc9eaa07db18657aa72617d2f73672e3977
● HOK	 x/epochs/types/hooks.go	80402e18f7598ef3c7d9313eb09819299604665410093c7a13a576c561bacb91
● HOT	 x/mint/types/hooks.go	4f29a632b0362f1f949f2385497d9bded47b264e6da60276a864636d6d8aaa6f
● MIT	 x/mint/types/minter.go	c24c74c654fc8e8e2c1c1fb33f54e2e762dae712d4f8fb3d8cd76bfd7ae1648c
● PAR	 x/mint/types/params.go	8edc2f68476afaf7b5ca846727ff948302cea5adf7876e113dec06c6e5d26b0
● ANT	 app/ante.go	82ab7be9101619620ea4edce262e33928b3a8a2e03f1692f2d0a9ff460de57f9
● EXP	 app/export.go	75ed7cb717265cbc146ad4e9d090a2c34bfd27a4c90b811d7bc8135363c42f52
● GEN	 app/genesis.go	fa720055e77331d79edf6ea877ea4cc3ab4cbee282681b10f77143e77f82b2c4
● UPG	 app/upgrades.go	d872085b59332e542c9c3e21c88ee727f8bc7533437327552436d8d47f13b3f1
● WAS	 app/wasm_config.go	71003ef47e0b1979d2eba3b0f6b1b354d841b6de7b0e36a196e087079fc08d07
● QUE	 x/epochs/client/cli/query.go	5a59349f045fbd0fe9db00c17205c00d6c3cd8adb0be759bf7e29a346629844f
● TXC	 x/epochs/client/cli/tx.go	435f39592ba4ad45f362c34985e3a4d9e1580c3ebe254c50a047542b7d934946
● ABC	 x/epochs/keeper/abci.go	6881cac6a33dbef6b5de27343375bb16ef92173e1429736977c608628b0ce0d4
● EPO	 x/epochs/keeper/epoch.go	9aecffb38b7a6faa79a218904bf7955aab7c66b293b504021b9165ceabd93c1e

ID	File	SHA256 Checksum
● GEE	 x/epochs/keeper/genesis.go	76e2052ac2c61ddf6dbb0e5914104358f854b59a33b72d137e07b490b3eeacf9
● GRP	 x/epochs/keeper/grpc_query.go	8a14893844011adac5dcceb02eadbe6388baca10326d1e5c059b33b5604c39fb
● HOO	 x/epochs/keeper/hooks.go	6befe03d4a47a5a7bd9a74f4608f51abf64ed95d3e86eeb787572e2124f9f5ed
● KEP	 x/epochs/keeper/keeper.go	c4886ce6b5add52a7884c97ea229b8a9043df4e7d81fd1c7ead9d482ae1ea5c8
● MOD	 x/epochs/module.go	e9787fe86b7cc46f686303559665c7231da84996bd589863f3a3761a7e4ef06a
● DOC	 x/epochs/types/doc.go	5ae31fc2ce8d08cde7ab47809cdfdb8f5ceedc9bd135458bc8ec89d27421fcc5
● EVE	 x/epochs/types/events.go	f8d4377c3cbb493a531673f549e7a9e3b03f3dd453ff31ec9181aca2283d6cfb
● GES	 x/epochs/types/genesis.go	270936f9be87802f0855b354ceca2ab96101a2c06235bdaf7653165e7dd2b7bc
● IDE	 x/epochs/types/identifier.go	030c5ffac1ee5145e442943ee944dae56c33bc30f05142ee84f92bc4c463971c
● KEY	 x/epochs/types/keys.go	44b33a8c93893a5a77893b37e644d48cc9431c17919b5e11ad01669861b918a6
● QUR	 x/mint/client/cli/query.go	8a83382c66070516319f4aaa96a71fafa0449eb180f3397cb6e92aa3891c67f0
● QUY	 x/mint/client/rest/query.go	f12c0c9c23a3654f52bcef077eec7b3296397eb0883705c6ebd38d7fbc7adcd3
● RES	 x/mint/client/rest/rest.go	bfc971f9950d2a908bcab2da856172e447de2aaa16211eef334e9592ca3f92fb
● GEI	 x/mint/keeper/genesis.go	4c41660d1c30813545c26c28ef3e5d76e16b9971c2d8fdf405b304c5990e3841
● GRC	 x/mint/keeper/grpc_query.go	c0c8f75c3b1df82e6a19fa01982f70a4be7a8ec58a9ce051970a2aa6eaa5c811
● HOS	 x/mint/keeper/hooks.go	fe205d0377fa773b7ffab68ef8126f71fabf343c954df57c2dd77922eead4af4
● KEK	 x/mint/keeper/keeper.go	28d6b9997881dab587928d9cb148b1101271a266ae42ccf6a02f3b4e271a57fc

ID	File	SHA256 Checksum
● MOU	 x/mint/module.go	cc4d937d963924e2a0bbb114410b4c98ef0391a35dbf0eccc0073c7637aa95f4
● COD	 x/mint/types/codec.go	e7f2bed92b9c0d4eb4044ec520190ae5f744d4efca3d5c09d1dcbe95b50bac19
● EVN	 x/mint/types/events.go	20641bd2199985f0bbc054a473765748811034960a8bd1e584f7fb681ab0486a
● EXE	 x/mint/types/expected_keepers.go	51215ecf7c15e63b14652813e3eabac4a72105c1662b5b5c7ebd1dede9fea837
● GET	 x/mint/types/genesis.go	a903130a761b630b3f790a26dc0e1f8ec89e9f5080052a7cdefc839d1c9152f6
● KES	 x/mint/types/keys.go	f9c808de4e0ccefc322c2e0aa24e351ea1739ab3cf918f2442004ebc94de2ee64
● MIN	 x/mint/types/mint.pb.go	9214a5ec70026590797fae7d2d8bcb869aef9cb6f4d6ef3a181c9a6b859329c5

APPROACH & METHODS | GOTABIT

This report has been prepared for Gotabit to discover issues and vulnerabilities in the source code of the Gotabit project as well as any contract dependencies that were not part of an officially recognized library. A comprehensive examination has been performed, utilizing Manual Review and Static Analysis techniques.

The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Ensuring contract logic meets the specifications and intentions of the client.
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- Thorough line-by-line manual review of the entire codebase by industry experts.

The security assessment resulted in findings that ranged from critical to informational. We recommend addressing these findings to ensure a high level of security standards and industry practices. We suggest recommendations that could better serve the project from the security perspective:

- Testing the smart contracts against both common and uncommon attack vectors;
- Enhance general coding practices for better structures of source codes;
- Add enough unit tests to cover the possible use cases;
- Provide more comments per each function for readability, especially contracts that are verified in public;
- Provide more transparency on privileged activities once the protocol is live.

FINDINGS | GOTABIT



6

Total Findings

0

Critical

1

Major

1

Medium

2

Minor

2

Informational

This report has been prepared to discover issues and vulnerabilities for Gotabit. Through this audit, we have uncovered 6 issues ranging from different severity levels. Utilizing the techniques of Manual Review & Static Analysis to complement rigorous manual code reviews, we discovered the following findings:

ID	Title	Category	Severity	Status
<u>TYP-01</u>	Possible Issue With 0 <code>ReductionFactor</code>	Logical Issue	Major	● Acknowledged
<u>PAR-01</u>	Incorrect Check Of 'Reductionfactor'	Logical Issue	Medium	● Acknowledged
<u>APP-01</u>	Redundant Code	Logical Issue	Minor	● Acknowledged
<u>PAR-02</u>	Wrong Error Message	Inconsistency	Minor	● Acknowledged
<u>6D4-01</u>	Unused Function	Coding Style	Informational	● Acknowledged
<u>HOK-01</u>	The <code>TODO</code> Comment	Coding Style	Informational	● Acknowledged

TYP-01 | POSSIBLE ISSUE WITH 0 ReductionFactor

Category	Severity	Location	Status
Logical Issue	● Major	x/mint/types/minter.go: 45~47; x/mint/types/params.go: 180~182	● Acknowledged

Description

```
180 if v.IsNegative() {  
181     return fmt.Errorf("reduction factor cannot be negative")  
182 }
```

x/mint/type/minter

```
45 func (m Minter) NextEpochProvisions(params Params) sdk.Dec {  
46     return m.EpochProvisions.Mul(params.ReductionFactor)  
47 }
```

The code in the `NextEpochProvisions` method of the `Minter` type in the `x/mint/type` package calls the `Mul` method of the `EpochProvisions` field. If the `ReductionFactor` parameter passed to this method is set to 0, the chain will not be able to mint new coins after a reduction has occurred. This is because a `ReductionFactor` of 0 means that no new coins can be created, and the total number of coins in circulation will not increase. It is important to ensure that the `ReductionFactor` is set to a positive value in order to allow the chain to continue minting new coins.

Recommendation

We recommend verifying that the value of the `v` variable is greater than 0.

Alleviation

[Gotabit Team]: The current design is multiplication, and the specifics can be determined by the upper layer. So there's no problem here.

PAR-01 | INCORRECT CHECK OF 'REDUCTIONFACTOR'

Category	Severity	Location	Status
Logical Issue	● Medium	x/mint/types/params.go: 176	● Acknowledged

Description

The total supply is calculated using the following formula, based on the code:

$$TotalSupply = InitialSupply + EpochsPerPeriod * \frac{InitialRewardsPerEpoch}{1 - ReductionFactor}$$

It is important to note that the value of `ReductionFactor` must be less than 1. Therefore, the check shown below is incorrect:

```
176 if v.GT(sdk.NewDec(1)) {  
177     return fmt.Errorf("reduction factor cannot be greater than 1")  
178 }
```

This check determines if the value of `v` is greater than 1, but it does not consider the possibility that `v` may be equal to 1. It is important to note that the value of `ReductionFactor` must be less than 1.

Recommendation

We recommend validating that the variable `v` should be greater than or equal to `sdk.NewDec(1)`.

Alleviation

[Gotabit Team]: The current design is multiplication, and the specifics can be determined by the upper layer. So there's no problem here.

APP-01 | REDUNDANT CODE

Category	Severity	Location	Status
Logical Issue	● Minor	app/app.go: 473	● Acknowledged

Description

The following code is unnecessary because the `hooks[]` array is always empty:

```
473 app.MintKeeper.SetHooks(minttypes.MultiMintHooks{})
```

This code is redundant because the `mint` module's hook has already been initialized in the `EpochsKeeper` as shown here:

```
477 app.EpochsKeeper.SetHooks(  
478     epochstypes.NewMultiEpochHooks(  
479         // insert epoch hooks receivers here  
480         app.MintKeeper.Hooks(),  
481     ),  
482 )
```

Recommendation

Please review the code to ensure that it meets the intended design.

Alleviation

The team acknowledged the finding.

PAR-02 | WRONG ERROR MESSAGE

Category	Severity	Location	Status
Inconsistency	● Minor	x/mint/types/params.go: 164	● Acknowledged

Description

The `validateReductionPeriodInEpochs` function is used to ensure that the value of `ReductionPeriodInEpochs` is valid, and it is called whenever this value needs to be checked. This function has no connection to the `validators` in the system, and it performs a separate set of checks on the value of `ReductionPeriodInEpochs` to ensure that it is valid.

Recommendation

The error message should be as follows:

```
164     return fmt.Errorf("ReductionPeriodInEpochs must be positive: %d", v)
```

We recommend correcting this information in order to improve the maintainability of the system.

Alleviation

The team acknowledged the finding.

6D4-01 | UNUSED FUNCTION

Category	Severity	Location	Status
Coding Style	● Informational	app/app.go: 882~888; x/mint/types/hooks.go: 19~21	● Acknowledged

Description

The following functions are not being used:

- `GetMaccPerms` in `app.go`
- `NewMultiMintHooks` in `hooks.go`

Recommendation

It is recommended to delete the unused code in order to maintain a clean and organized codebase.

Alleviation

The team acknowledged the finding.

HOK-01 | THE `TODO` COMMENT

Category	Severity	Location	Status
Coding Style	● Informational	x/epochs/types/hooks.go: 52	● Acknowledged

Description

There is a TODO comment on the aforementioned line. It appears that there is an unfinished function based on the comment. If this is not the case, it is recommended to remove the unnecessary TODO comment. As a best practice, product code should not contain TODO comments.

Recommendation

Please review this code to ensure that it meets the intended design and that all necessary functions are completed.

Alleviation

The team acknowledged the finding.

APPENDIX | GOTABIT

Finding Categories

Categories	Description
Logical Issue	Logical Issue findings detail a fault in the logic of the linked code, such as an incorrect notion on how <code>block.timestamp</code> works.
Coding Style	Coding Style findings usually do not affect the generated byte-code but rather comment on how to make the codebase more legible and, as a result, easily maintainable.
Inconsistency	Inconsistency findings refer to functions that should seemingly behave similarly yet contain different code, such as a constructor assignment imposing different require statements on the input variables than a setter function.

Checksum Calculation Method

The "Checksum" field in the "Audit Scope" section is calculated as the SHA-256 (Secure Hash Algorithm 2 with digest size of 256 bits) digest of the content of each file hosted in the listed source repository under the specified commit.

The result is hexadecimal encoded and is the same as the output of the Linux `sha256sum` command against the target file.

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