



September 25th 2020 — Quantstamp Verified

## Hedera Stablecoin

This security assessment was prepared by Quantstamp, the leader in blockchain security

### Executive Summary

| Type                               | Hedera Stablecoin  |            |        |                                    |                         |
|------------------------------------|--|------------|--------|------------------------------------|-------------------------|
| Auditors                           | Jan Gorzny, Blockchain Researcher<br>Kacper Bqk, Senior Research Engineer<br>Ed Zulkoski, Senior Security Engineer                             |            |        |                                    |                         |
| Timeline                           | 2020-08-17 through 2020-09-24  |            |        |                                    |                         |
| Languages                          | Java   |            |        |                                    |                         |
| Methods                            | Architecture Review, Unit Testing, Functional Testing, Manual Review   |            |        |                                    |                         |
| Specification                      | Semi-Formal Specification<br>K Formal Specification  |            |        |                                    |                         |
| Documentation Quality              | <div><div></div>High</div>   |            |        |                                    |                         |
| Test Quality                       | <div><div></div>High</div>   |            |        |                                    |                         |
| Source Code                        | <table><tr><th>Repository</th><th>Commit</th></tr><tr><td><a href="#">hedera-stable-coin</a></td><td><a href="#">df0958b</a></td></tr></table> | Repository | Commit | <a href="#">hedera-stable-coin</a> | <a href="#">df0958b</a> |
| Repository                         | Commit   |            |        |                                    |                         |
| <a href="#">hedera-stable-coin</a> | <a href="#">df0958b</a>  |            |        |                                    |                         |

|       |   |
|-------|---|
| Goals | <ul style="list-style-type: none"><li>Review the code for potential flaws and issues</li><li>Ensure that the code matches the specification</li></ul> |
|-------|---|

|                           |                |
|---------------------------|----------------|
| Total Issues              | 2 (2 Resolved) |
| High Risk Issues          | 1 (1 Resolved) |
| Medium Risk Issues        | 1 (1 Resolved) |
| Low Risk Issues           | 0 (0 Resolved) |
| Informational Risk Issues | 0 (0 Resolved) |
| Undetermined Risk Issues  | 0 (0 Resolved) |



|               |   |
|---------------|---|
| High Risk     | The issue puts a large number of users' sensitive information at risk, or is reasonably likely to lead to catastrophic impact for client's reputation or serious financial implications for client and users. |
| Medium Risk   | The issue puts a subset of users' sensitive information at risk, would be detrimental for the client's reputation if exploited, or is reasonably likely to lead to moderate financial impact.                 |
| Low Risk      | The risk is relatively small and could not be exploited on a recurring basis, or is a risk that the client has indicated is low-impact in view of the client's business circumstances.                        |
| Informational | The issue does not post an immediate risk, but is relevant to security best practices or Defence in Depth.  |
| Undetermined  | The impact of the issue is uncertain.   |

|              |   |
|--------------|---|
| Unresolved   | Acknowledged the existence of the risk, and decided to accept it without engaging in special efforts to control it.   |
| Acknowledged | The issue remains in the code but is a result of an intentional business or design decision. As such, it is supposed to be addressed outside the programmatic means, such as: 1) comments, documentation, README, FAQ; 2) business processes; 3) analyses showing that the issue shall have no negative consequences in practice (e.g., gas analysis, deployment settings). |
| Resolved     | Adjusted program implementation, requirements or constraints to eliminate the risk.   |
| Mitigated    | Implemented actions to minimize the impact or likelihood of the risk.   |

## Summary of Findings

The code is clean and matches the provided specification. The code has high test coverage and is easy-to-read, with appropriate conditions clearly marked in the code. Initially, two issues were detected, but both were straightforward fixes and have since been resolved. There are no outstanding issues regarding best practices.

| ID    | Description                       | Severity  | Status |
|-------|-----------------------------------|-----------|--------|
| QSP-1 | Address Mismatch                  | ⬆️ High   | Fixed  |
| QSP-2 | Potential Denial-of-Service (DOS) | ⬆️ Medium | Fixed  |

## Quantstamp Audit Breakdown

Quantstamp's objective was to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices.

Possible issues we looked for included (but are not limited to):

- Transaction-ordering dependence
- Timestamp dependence
- Mishandled exceptions and call stack limits
- Unsafe external calls
- Integer overflow / underflow
- Number rounding errors
- Reentrancy and cross-function vulnerabilities
- Denial of service / logical oversights
- Access control
- Centralization of power
- Business logic contradicting the specification
- Code clones, functionality duplication
- Gas usage
- Arbitrary token minting

### Methodology

The Quantstamp 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 Quantstamp 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 Quantstamp 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 analyzing a program to determine what inputs cause 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, and actionable recommendations to help you take steps to secure your smart contracts.

## Findings

### QSP-1 Address Mismatch

Severity: High Risk

Status: Fixed

File(s) affected: Address.java

Description: Address.java Line 10: In the specification, addresses use 384-bit. However the code defines ZERO address as 256-bit: new Address(PublicKey.fromBytes(new byte[32]));.

If there is a size-mismatch in the logic, the equality would fail, and may cause problematic scenarios.

Update: The specification has been changed to 256-bit addresses.

### QSP-2 Potential Denial-of-Service (DOS)

Severity: Medium Risk

Status: Fixed

**Description:** The code on its own doesn't introduce any throttling or limit the computations that can be done on [BigInteger](#) types. A malicious user could submit try to create a deny service of the system by submitting large chunks of data that could still be executed (e.g., addition of large integers).  
**Update:** A check that values are not too large has been added.

## Adherence to Best Practices

- [App.java](#): Lines 28 and 112 have [TODO](#) items; these should be fixed or removed. **Update:** these have been removed.
- [App.java](#): Line 84 contains a [fixme](#); this should be fixed or removed. **Update:** this has been removed.
- [App.java](#): Line 35 looks for an environment variable [HSC\\_OPERATOR\\_KEY](#) but has an error message discussing the environment variable [HSC\\_OPERATOR\\_ID](#); change the latter to match the variable that is sought. **Update:** fixed.
- [TopicListener.java](#): Lines 84, 95, 111, and 119 have [TODO](#) items; these should be fixed or removed. **Update:** these have been removed.
- [TopicListener.java](#): Line 98 contains a [fixme](#); this should be fixed or removed. **Update:** this has been removed.
- [ChangeSupplyManagerTransactionHandler.java](#): Line 27 -- could use [ensureTransferAllowed\(\)](#) instead (see [ChangeAssetProtectionManagerTransactionHandler.java](#) line 27). **Update:** this has been fixed.
- [MintTransactionHandler.java/TransactionHandler.java](#): the former file calls [ensureSupplyManager](#) that also checks if the owner was the caller, which is defined in the latter. Since it can also be called by the [Owner](#), this function should be renamed. The function may be called in other places, too. **Update:** this function has been renamed.
- [TransactionHandler.java](#): Line 18 contains a [TODO](#); this should be fixed or removed. **Update:** this has been removed.
- [TransactionHandler.java](#): Line 60 contains a [fixme](#); this should be fixed or removed. **Update:** this has been removed.
- [State.java](#): The variable [tokenDecimal](#) could be made [Int](#) as it's unlikely that any token will have more than 2^32 (or 2^64) decimal places. **Update:** this has been fixed.

## Test Results

### Test Suite Results

```
> Task :test

com.hedera.hashgraph.stablecoin.app.UnsetKycPassedTest > unsetKycPassedTest() STANDARD_OUT
    OK

com.hedera.hashgraph.stablecoin.app.UnsetKycPassedTest > unsetKycPassedTest() PASSED

com.hedera.hashgraph.stablecoin.app.ApproveTest > approveTest() PASSED

com.hedera.hashgraph.stablecoin.app.TransferTest > transferTest() PASSED

com.hedera.hashgraph.stablecoin.app.ApproveExternalTransferTest > approveExternalTransferTest() PASSED

com.hedera.hashgraph.stablecoin.app FreezeTest > freezeTest() PASSED

com.hedera.hashgraph.stablecoin.app.ChangeEnforcementManagerTest > changeEnforcementManagerTest() PASSED

com.hedera.hashgraph.stablecoin.app.DecreaseAllowanceTest > decreaseAllowanceTest() PASSED

com.hedera.hashgraph.stablecoin.app.StableCoinPreCheckExceptionTest > stableCoinPreCheckExceptionTest() PASSED

com.hedera.hashgraph.stablecoin.app.ProposeOwnerTest > proposeOwnerTest() PASSED

com.hedera.hashgraph.stablecoin.app.ChangeSupplyManagerTest > changeSupplyManagerTest() PASSED

com.hedera.hashgraph.stablecoin.app.StateTest > stateTest() PASSED

com.hedera.hashgraph.stablecoin.app.TopicListenerTest > topicListenerTest() PASSED

com.hedera.hashgraph.stablecoin.app.ChangeComplianceManagerTest > changecomplianceManagerTest() PASSED

com.hedera.hashgraph.stablecoin.app.SetKycPassedTest > setKycPassedTest() PASSED

com.hedera.hashgraph.stablecoin.app.ExternalTransferTest > transferFromTest() PASSED

com.hedera.hashgraph.stablecoin.app.ConstructorTest > constructorTest() PASSED

com.hedera.hashgraph.stablecoin.app.BurnTest > burnTest() PASSED

com.hedera.hashgraph.stablecoin.app.TransferFromTest > transferFromTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > getSupplyManager() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > getTotalSupplyTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > getTokenDecimalTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > getBalanceTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > getTokenSymbolTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > getAllowanceTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > isFrozenTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > getTokenNameTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > getAssetManagerTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > getOwnerTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > isKycPassedTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > isPrivilegedRoleTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > getProposedOwnerTest() PASSED

com.hedera.hashgraph.stablecoin.app.GettersTest > checkTransferAllowedTest() PASSED

com.hedera.hashgraph.stablecoin.app.UnfreezeTest > unfreezeTest() PASSED

com.hedera.hashgraph.stablecoin.app.MintTest > mintTest() STANDARD_OUT
    Address#equals c98e91de0b9015851c1b25bbd346588f4ba0578041457ed88548327a0395ddb6 <=> c98e91de0b9015851c1b25bbd346588f4ba0578041457ed88548327a0395ddb6
```



```
Address#equals [-55, -114, -111, -34, 11, -112, 21, -123, 28, 27, 37, -69, -45, 70, 88, -113, 75, -96, 87, -128, 65, 69, 126, -40, -123, 72, 50, 122, 3, -107, -35, -74] <=> [-55, -114, -111, -34, 11, -112, 21, -123, 28, 27, 37, -69, -45, 70, 88, -113, 75, -96, 87, -128, 65, 69, 126, -40, -123, 72, 50, 122, 3, -107, -35, -74]

com.hedera.hashgraph.stablecoin.app.MintTest > mintTest() PASSED

com.hedera.hashgraph.stablecoin.app.ClaimOwnershipTest > claimOwnershipTest() PASSED

com.hedera.hashgraph.stablecoin.app.TransactionHandlerTest > transactionHandlerTest() PASSED

com.hedera.hashgraph.stablecoin.app.WipeTest > wipeTest() PASSED

com.hedera.hashgraph.stablecoin.app.IncreaseAllowanceTest > increaseAllowanceTest() PASSED

com.hedera.hashgraph.stablecoin.app.ExternalTransferFromTest > transferFromTest() PASSED

> Task :printJacoco

Code Coverage:

WipeTransactionHandler: Instructions: 100%, Branches: 100%
BurnTransactionHandler: Instructions: 100%, Branches: 100%
DecreaseAllowanceTransactionHandler: Instructions: 100%, Branches: 100%
ChangeSupplyManagerTransactionHandler: Instructions: 100%, Branches: 100%
ProposeOwnerTransactionHandler: Instructions: 100%, Branches: 100%
TransferTransactionHandler: Instructions: 100%, Branches: 100%
ExternalTransferTransactionHandler: Instructions: 100%, Branches: 100%
MintTransactionHandler: Instructions: 100%, Branches: 100%
ConstructTransactionHandler: Instructions: 100%, Branches: 100%
TransactionHandler: Instructions: 100%, Branches: 100%
ChangeComplianceManagerTransactionHandler: Instructions: 100%, Branches: 100%
UnsetKycPassedTransactionHandler: Instructions: 100%, Branches: 100%
ApproveExternalTransferTransactionHandler: Instructions: 100%, Branches: 100%
UnfreezeTransactionHandler: Instructions: 100%, Branches: 100%
StableCoinPreCheckException: Instructions: 100%, Branches: 100%
ExternalTransferFromTransactionHandler: Instructions: 100%, Branches: 100%
SetKycPassedTransactionHandler: Instructions: 100%, Branches: 100%
FreezeTransactionHandler: Instructions: 100%, Branches: 100%
ClaimOwnershipTransactionHandler: Instructions: 100%, Branches: 100%
ApproveAllowanceTransactionHandler: Instructions: 100%, Branches: 100%
TransferFromTransactionHandler: Instructions: 100%, Branches: 100%
ChangeEnforcementManagerTransactionHandler: Instructions: 100%, Branches: 100%
IncreaseAllowanceTransactionHandler: Instructions: 100%, Branches: 100%
TopicListener: Instructions: 78.9351851900%, Branches: 70.0%
State: Instructions: 100%, Branches: 100%
TransferTransactionArguments: Instructions: 100%, Branches: 100%
DecreaseAllowanceTransactionArguments: Instructions: 100%, Branches: 100%
ExternalTransferTransactionArguments: Instructions: 100%, Branches: 100%
MintTransactionArguments: Instructions: 100%, Branches: 100%
ProposeOwnerTransactionArguments: Instructions: 100%, Branches: 100%
ChangeSupplyManagerTransactionArguments: Instructions: 100%, Branches: 100%
IncreaseAllowanceTransactionArguments: Instructions: 100%, Branches: 100%
FreezeTransactionArguments: Instructions: 100%, Branches: 100%
ChangeEnforcementManagerTransactionArguments: Instructions: 100%, Branches: 100%
UnfreezeTransactionArguments: Instructions: 100%, Branches: 100%
WipeTransactionArguments: Instructions: 100%, Branches: 100%
ExternalTransferFromTransactionArguments: Instructions: 100%, Branches: 100%
ConstructTransactionArguments: Instructions: 100%, Branches: 100%
ClaimOwnershipTransactionArguments: Instructions: 100%, Branches: 100%
UnsetKycPassedTransactionArguments: Instructions: 100%, Branches: 100%
ApproveExternalTransferTransactionArguments: Instructions: 100%, Branches: 100%
BurnTransactionArguments: Instructions: 100%, Branches: 100%
ChangeComplianceManagerTransactionArguments: Instructions: 100%, Branches: 100%
TransferFromTransactionArguments: Instructions: 100%, Branches: 100%
SetKycPassedTransactionArguments: Instructions: 100%, Branches: 100%
ApproveAllowanceTransactionArguments: Instructions: 100%, Branches: 100%

BUILD SUCCESSFUL in 16s
```

## Appendix

### File Signatures

The following are the SHA-256 hashes of the reviewed files. A file with a different SHA-256 hash has been modified, intentionally or otherwise, after the security review. You are cautioned that a different SHA-256 hash could be (but is not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of the review.

#### Contracts

- 7581babbe884259b8710516ae032a723582567917670cccd179b36665814b3c5  
./src/test/java/com/hedera/hashgraph/stablecoin/app/ApproveExternalTransferTest.java
- 516d290e886cf3719abcf15b217d6ef1596309927745400f422ea87d4eb6c157 ./src/test/java/com/hedera/hashgraph/stablecoin/app/ApproveTest.java
- c6155bdf36ca4cbd88c7dfad2555eb9fdcc3f7ad7b3c75a68ae93ab8bde44823 ./src/test/java/com/hedera/hashgraph/stablecoin/app/BurnTest.java
- b6d5c9646d448c2b2c1b2a13d00192a803c3810cf48956a2f6c12cb704da2f91  
./src/test/java/com/hedera/hashgraph/stablecoin/app/ChangeComplianceManagerTest.java
- efebf479062a291d59389a4a8fd326c3bc5f350945e7f9e3543b34431f5199de  
./src/test/java/com/hedera/hashgraph/stablecoin/app/ChangeEnforcementManagerTest.java
- 930540b6d2aae9f9498dff6abbb1c9fae5ca636ddb67e59887e81042350a99b6  
./src/test/java/com/hedera/hashgraph/stablecoin/app/ChangeSupplyManagerTest.java
- 68ce3ef2a6095486359dac71390b231b88b2e45c40ef83b5a6905f728a8d1729 ./src/test/java/com/hedera/hashgraph/stablecoin/app/ClaimOwnershipTest.java
- 12d60d017e00a92667e4b1d1c702dd610c34276e300fae0c6188774898161782 ./src/test/java/com/hedera/hashgraph/stablecoin/app/ConstructorTest.java
- a97c23e6b51a25f584c66042c6bfa26b3c457fb0811b0f1fbcc94b273fb0a66f  
./src/test/java/com/hedera/hashgraph/stablecoin/app/DecreaseAllowanceTest.java
- a952062f05d1aa63226a1cec47a3a100d2d7e1517a422bcf5c2d7d61db8152f5  
./src/test/java/com/hedera/hashgraph/stablecoin/app/ExternalTransferFromTest.java
- 2899792f63ec465df64e383949507e1da3cf87977023fcbbc69dff0f9a56458c ./src/test/java/com/hedera/hashgraph/stablecoin/app/ExternalTransferTest.java
- 3f585623efe4818ebbf018cf4cafb33b59a7082bca7e917bedacb6f791736f26 ./src/test/java/com/hedera/hashgraph/stablecoin/app/FreezeTest.java
- 1f51c7cd25911b395509d6beafafa39f0f8d639e221c86323ae341da0932fb20 ./src/test/java/com/hedera/hashgraph/stablecoin/app/GettersTest.java
- a51e02855f2d21b072a3b15a0148244be2c34e0cd13adc528b7c04cc59ddd91  
./src/test/java/com/hedera/hashgraph/stablecoin/app/IncreaseAllowanceTest.java
- 68b4228d3154bc45680c9011472ede53f93a8f3a73dcb73d24d9d84c02b35324 ./src/test/java/com/hedera/hashgraph/stablecoin/app/MintTest.java
- 2df54732dfae4f72fba91d52aefd5f79c0e525ac6fd8061c691d71a751f671a9 ./src/test/java/com/hedera/hashgraph/stablecoin/app/ProposeOwnerTest.java
- 305a4f14757f90d1ffd69b0136d68767cbcfbf35f74d1ec4a27b5272c4e2153a ./src/test/java/com/hedera/hashgraph/stablecoin/app/SetKycPassedTest.java
- 5177dcb9804014f022121fa3e7663d406ae2683f8c40eb14daa28bdaa7396d4f  
./src/test/java/com/hedera/hashgraph/stablecoin/app/StableCoinPreCheckExceptionTest.java
- cc83cb67eec4c9929cd9d854bfa50c373170c3792dd0b3ea696172b0979a7f10 ./src/test/java/com/hedera/hashgraph/stablecoin/app/StateTest.java



c46c289ed0cb95e8cc73604dd51df0d2d54b415f99a1854b1b3a9acfce4e3625 ./src/test/java/com/hedera/hashgraph/stablecoin/app/TopicListenerTest.java

9a7e99e9e8c20312ca33cf408a170c4c08fb3153772bbc9756ceb19112c89e16  
./src/test/java/com/hedera/hashgraph/stablecoin/app/TransactionHandlerTest.java

ed485f2d2c6c51b36c0b58e6fcac5d64780e32c56c63a7fcbcb4de49213526d63 ./src/test/java/com/hedera/hashgraph/stablecoin/app/TransferFromTest.java

9842dd251e0d49d953f0ae5ff3fa8cccf02844c5f52070386d4abec8a5c4edd1 ./src/test/java/com/hedera/hashgraph/stablecoin/app/TransferTest.java

521240b3b6c5343e97630b7f161409cfe6ef4381acaf3fd1e77fd55ecf220f49 ./src/test/java/com/hedera/hashgraph/stablecoin/app/UnfreezeTest.java

04c34aa1b76460b8d3d0c9ea2648a1768190d509594eda9ed9821274c9658306 ./src/test/java/com/hedera/hashgraph/stablecoin/app/UnsetKycPassedTest.java

2acc74a473a1a000963357f7e1778fa6a408ef5f964b3ddf5e3b4c6049982309 ./src/test/java/com/hedera/hashgraph/stablecoin/app/WipeTest.java

9a6a017e5c85f2005c697d768647b326edee2a9fa88e87a9395f477987477173 ./src/main/java/com/hedera/hashgraph/stablecoin/app/App.java

527dc9e0875f7cb5607748139aadbd42a07e2bf506a5cbcb8dc456010ca88c09 ./src/main/java/com/hedera/hashgraph/stablecoin/app/Benchmark.java

18d222b35a0a752d37c0faaff2e6b6574e5d708a3ae07dfc63e8426ffa029a04c ./src/main/java/com/hedera/hashgraph/stablecoin/app/CommitInterval.java

af62cedf4f3c4fd6e19b0892ae3c752d0588211c478f577efa859b372c521e59 ./src/main/java/com/hedera/hashgraph/stablecoin/app/package-info.java

ca8022c1359364563b3233551b61fb9fa6ce76ff3d5533b9665f34e8b06b1911 ./src/main/java/com/hedera/hashgraph/stablecoin/app/SnapshotManager.java

47690c6b5dde496e109c74736ba5dd92d59cd78585b7e5536a43f158d6e878ce ./src/main/java/com/hedera/hashgraph/stablecoin/app/SqlConnectionManager.java

d9d922ee7b0932f60845366ad36554cf43691a4089019a3d957d9274a7baa9dd ./src/main/java/com/hedera/hashgraph/stablecoin/app/State.java

d40a59e5e61b330cd4b4bbbb6caa9a71be45da44c21460b1c78be009333733a0 ./src/main/java/com/hedera/hashgraph/stablecoin/app/Status.java

d4dc3cf157f243614a34dd64f37febb25c9c6224a10aad10f385bd18358316ee ./src/main/java/com/hedera/hashgraph/stablecoin/app/TopicListener.java

a5ddeb76e382e858a03974d4f373133fd0218888c75f6820cf037e335fc3f63 ./src/main/java/com/hedera/hashgraph/stablecoin/app/TransactionReceipt.java

dc5f467deeb91c38634de15bf239cfbc1226cf0284427b8a119d3ce4745263f ./src/main/java/com/hedera/hashgraph/stablecoin/app/Tuple3.java

c3a3ed4f8358600ea1181644f74977b2ee7071d9bfdb5cc90a5f225fc6ba722c  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/ApproveAllowanceTransactionDataRepository.java

3cc2a9bc4c654bf4261c91aab1ac76a7c6302e7dccc8e25392298c774d7a923  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/ApproveExternalTransferTransactionDataRepository.java

93b5a7926dd4f95e2b75b4dff13ea079b09f45e8cedf1c6b7b3e9a9d9132d51c  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/BurnTransactionDataRepository.java

25f72224583e726c9aeae6e2bce812b7229b32cec8fda262353e7651a60bb2bc  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/ChangeComplianceManagerTransactionDataRepository.java

43766baf9daf235a8589a2706b70d03d9644b9f184a766949a3c6bae97b3ebf  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/ChangeEnforcementManagerTransactionDataRepository.java

49fba1f0ac0e0552c3109673e53c5737a887d6080444e73ca1086e84452cf14a  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/ChangeSupplyManagerTransactionDataRepository.java

a5397f2d579dd40c8706d860a5ca2879fba75e204956eb22ef316de411f105a9  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/ConstructTransactionDataRepository.java

dece45a7fe4cd0f5b0d7cfed75d50fa759e8af448d09490734af5d99ab993eff  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/DecreaseAllowanceTransactionDataRepository.java

63f2f793945dbf50e20ac9f7fe36c2584c2e8cb17de859f2b8d2d1482edb042f  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/ExternalTransferFromTransactionDataRepository.java

f4e3d995d21b2295d1463ce42ef4a618d5b441307133e1c7fc618bff216d43bc  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/ExternalTransferTransactionDataRepository.java

659333f98531953059b8e0d97a2f50ccf2a313e5c136929ce0b7e24bb418c2dd  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/FreezeTransactionDataRepository.java

640e78e2738338f7f2f21995bde3d559d3611b597e53eb5f02bc2b539c29fd1e  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/GetTransactionStatus.java

84484ae4d2e538d9966674f80e81fe68148777c5d10a74e889fc5d0214ea713  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/IncreaseAllowanceTransactionDataRepository.java

4c12520c052ebcbe81d36426fc79b924857b097c3abb2cb0000d0757de248a62  
./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/MintTransactionDataRepository.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/ProposeOwnerTransactionDataRepository.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/SetKycPassedTransactionDataRepository.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/repository/UnfreezeTransactionDataRepository.java

974074ee0e73584d0cfa6850b90942c476d4e89ccc077580be83e7a877dda5e4  
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7ad930d1d21c3c9c08c5d362893a912561100e0f527853f586ccca14a6860570  
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./src/main/java/com/hedera/hashgraph/stablecoin/app/handler/ApproveAllowanceTransactionHandler.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/handler/ApproveExternalTransferTransactionHandler.java

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828abc7893817379269ce0261b3720b75c951be34417c61ee3646c066e822094  
./src/main/java/com/hedera/hashgraph/stablecoin/app/handler/ChangeComplianceManagerTransactionHandler.java



a8710f03337306e24c883f3c38f38c72669aa97d000cfd666fac4a09f46234f  
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./src/main/java/com/hedera/hashgraph/stablecoin/app/handler/ExternalTransferFromTransactionHandler.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/handler/SetKycPassedTransactionHandler.java

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8d372e7d06ee46a9eac86d3dfdb287f991c4a9649d78f5064fc10ae83fe865ca  
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./src/main/java/com/hedera/hashgraph/stablecoin/app/handler/arguments/ApproveAllowanceTransactionArguments.java

5a81cb9ada51899273d953c878214071b2fd478ccea38263c5a0a1828894ea8  
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./src/main/java/com/hedera/hashgraph/stablecoin/app/emitter/ApproveExternalTransferEmitter.java

66f67b4b425c006882f9a3cd6bf7da225265780a7ded054408ddfc0657f2945d ./src/main/java/com/hedera/hashgraph/stablecoin/app/emitter/BurnEmitter.java

49e1764a1df107a7d705ddff53948e780ca51a9b737d0ce33bec0fcc259e17b9  
./src/main/java/com/hedera/hashgraph/stablecoin/app/emitter/ChangeComplianceManagerEmitter.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/emitter/ExternalTransferEmitter.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/emitter/UnsetKycPassedEmitter.java

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1290686a0d098977a05bcae8281100252a8643a494f8816559d9aeb5385d55c9 ./src/main/java/com/hedera/hashgraph/stablecoin/app/db/DefaultCatalog.java

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16a663bdf7fe27dedc48e62b25bb7f366c4541d13a668d6cc19ff0d931e767b28 ./src/main/java/com/hedera/hashgraph/stablecoin/app/db/Tables.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/db/tables/TransactionFreeze.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/db/tables/TransactionSetKycPassed.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/db/routines/DecompressChunk.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/db/routines/DetachTablespace.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/db/routines/Interpolate3.java

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./src/main/java/com/hedera/hashgraph/stablecoin/app/db/routines/Interpolate4.java

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df7bb907b31d655793bb03932788ea5f07276b847f3fa2fc64837affa5c4723e ./src/main/java/com/hedera/hashgraph/stablecoin/app/api/AddressHandler.java

daabf53f3b1ef901bf5b421a7731f70d27a38c63902f743bf380f3542faaf950  
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01885b58ddf85acd74569225c169a0a8ca75e73e664fca10fb7b0540bf53e9fa ./src/main/java/com/hedera/hashgraph/stablecoin/app/api/EventHandler.java

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412e78c09d8845145c752caa1a8f3cb885d0aa69aa189fa2311f1dddf2b14776  
./src/main/java/com/hedera/hashgraph/stablecoin/app/api/TransactionResponseItem.java

## Changelog

- 2020-08-24 - Initial report [9b56fda]
- 2020-09-24 - Revised Report [df0958b]



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