

CLAIMS

What is claimed is:

1. A method, comprising:

generating, by a processor, an account hash, ~~wherein the account hash comprises~~ comprising a cryptographic hash of at least one data element from a merchant-stored transaction account data;

invoking, by the processor, a maintenance smart contract to determine that the account hash matches a primary account hash or a past account hash that is associated with the primary account hash, the primary account hash and the past account hash being stored in a distributed ledger, the past account hash having a primary hash designation prior to the primary account hash being written to the distributed ledger, and the maintenance smart contract being invoked by ~~passing~~ sending the account hash and at least one data element from the merchant-stored transaction account data to the maintenance smart contract;

~~wherein in response to being invoked the maintenance smart contract is configured to determine whether the account hash matches a stored primary account hash or a stored past account hash, and~~

~~wherein~~ receiving, by the processor, an updated account hash from the maintenance smart contract in response to the maintenance smart contract determining that the account hash matches the stored past account hash instead of the primary account hash, the updated account hash corresponding to the primary account hash, the maintenance smart contract is configured to return an associated primary account hash to the processor;

transmitting, by the processor, the ~~associated updated primary account hash~~ and the account hash to an issuer system,

~~wherein in response to receiving the associated primary account hash and the account hash the issuer system is being configured to determine an updated transaction account data based at least in part on the associated primary updated account hash in response to receiving the updated account hash and the account hash; and~~

updating, by the processor, the merchant-stored transaction account data based at least in part on the updated transaction account data from the issuer system.

2. The method of claim 1, ~~wherein the processor is configured to generate the account hash in response to receiving a transaction request, and wherein further comprising authorizing, via the processor, a transaction request in response to receiving the updated transaction account data from the issuer system, the processor is configured to authorize the transaction request.~~

3. The method of claim 1 or 2, wherein the merchant-stored transaction account data comprises at least one of a user first name, a user last name, an issuer identifier, a transaction account number, a transaction account address, a transaction account security code, or a transaction account expiration date.

4. The method of any of claims 1-3, further comprising:

——— ~~receiving, by the processor, an account on file request comprising the merchant-stored transaction account data;~~

——— ~~generating, by the processor, a stored account hash, wherein the stored account hash comprises a cryptographic hash of at least one data element from the merchant-stored transaction account data; and~~

——— ~~invoking, by the processor, the maintenance smart contract by passing the stored account hash and at least one data element from the merchant-stored transaction account data;~~

——— ~~wherein in response to being invoked, the maintenance smart contract is configured to write the stored account hash and the at least one data element from the merchant-stored transaction account data to a maintained accounts blockchain.~~

5. The method of claim 4, ~~wherein in response to writing to the maintained accounts blockchain, the maintenance smart contract is configured to notify the issuer system of the write, and wherein the issuer system is configured to validate the write to the maintained accounts blockchain by determining whether the stored account hash and the at least one data element from the merchant-stored transaction account are up to date.~~

6. The method of any of claims 1-5, wherein:

~~the issuer system is configured to generate an issuer account hash in response to receiving a transaction account update request,~~

~~the issuer account hash comprises a cryptographic hash of at least one data element from an issuer stored transaction account data,~~

~~the issuer system is configured to invoke the maintenance smart contract by passing the issuer account hash and at least one data element from the issuer stored transaction account data, and~~

~~in response to being invoked, the maintenance smart contract is configured to write the issuer account hash and the at least one data element from the issuer stored transaction account data to the maintained accounts blockchain.~~

7. The method of claim 6, further comprising:

~~retrieving, by the processor, the issuer account hash and the at least one data element from the issuer stored transaction account data from the maintained accounts blockchain; and~~

~~updating, by the processor, the merchant stored transaction account data based on the issuer stored transaction account data.~~

48. A system comprising:

a processor; and

a tangible, non-transitory memory configured to communicate with the processor,

the tangible, non-transitory memory having instructions stored thereon that, in response to execution by the processor, cause the processor to perform operations comprising:

generating, by the processor, an account hash, ~~wherein the account hash comprises~~ comprising a cryptographic hash of at least one data element from a merchant-stored transaction account data;

invoking, by the processor, a maintenance smart contract to determine that the account hash matches a primary account hash or a past account hash that is associated with the primary account hash, the primary account hash and the past account hash being stored in a distributed ledger, the past account hash having a primary hash designation prior to the primary account hash being written to the distributed ledger, and the maintenance smart contract being invoked by ~~passing~~ sending the account hash and at least one data element from the merchant-stored transaction account data to the maintenance smart contract;

~~wherein in response to being invoked the maintenance smart contract is configured to determine whether the account hash matches a stored primary account hash or a stored past account hash, and~~

~~wherein receiving, by the processor, an updated account hash from the maintenance smart contract in response to the maintenance smart contract determining that the account hash matches the stored past account hash instead of the primary account hash, the maintenance smart contract is configured to return an associated primary account hash to the processor;~~

~~transmitting, by the processor, the associated primary updated account hash and the account hash to an issuer system,~~

~~wherein in response to receiving the associated primary account hash and the account hash the issuer system is being configured to determine an updated transaction account data based at least in part on the associated primary updated account hash and the account hash; and~~

~~updating, by the processor, the merchant-stored transaction account data based at least in part on the updated transaction account data from the issuer system.~~

~~59. The system of claim 48, wherein the processor is configured to generate the account hash in response to receiving a transaction request, and wherein, when executed, the instructions further cause the processor to perform the operations comprising authorizing a transaction request in response to receiving the updated transaction account data from the issuer system, the processor is configured to authorize the transaction request.~~

~~640. The system of claim 48 or 59, wherein the merchant-stored transaction account data comprises at least one of a user first name, a user last name, an issuer identifier, a transaction account number, a transaction account address, a transaction account security code, or a transaction account expiration date.~~

~~11. The system of any of claims 8-10, further comprising:~~

~~receiving, by the processor, an account on file request comprising the merchant stored transaction account data;~~

~~—generating, by the processor, a stored account hash, wherein the stored account hash comprises a cryptographic hash of at least one data element from the merchant stored transaction account data; and~~

~~—invoking, by the processor, the maintenance smart contract by passing the stored account hash and at least one data element from the merchant stored transaction account data;~~

~~—wherein in response to being invoked, the maintenance smart contract is configured to write the stored account hash and the at least one data element from the merchant stored transaction account data to an maintained accounts blockchain.~~

12. The system of claim 11, wherein in response to writing to the maintained accounts blockchain, the maintenance smart contract is configured to notify the issuer system of the write, and wherein the issuer system is configured to validate the write to the maintained accounts blockchain by determining whether the stored account hash and the at least one data element from the merchant stored transaction account are up to date.

13. The system of any of claims 8-12, wherein:

~~the issuer system is configured to generate an issuer account hash in response to receiving a transaction account update request;~~

~~—the issuer account hash comprises a cryptographic hash of at least one data element from an issuer stored transaction account data;~~

~~—the issuer system is configured to invoke the maintenance smart contract by passing the issuer account hash and at least one data element from the issuer stored transaction account data; and~~

~~—in response to being invoked, the maintenance smart contract is configured to write the issuer account hash and the at least one data element from the issuer stored transaction account data to the maintained accounts blockchain.~~

14. The system of claim 13, further comprising:

~~—retrieving, by the processor, the issuer account hash and the at least one data element from the issuer stored transaction account data from the maintained accounts blockchain; and~~

~~updating, by the processor, the merchant-stored transaction account data based on the issuer-stored transaction account data.~~

715. An article of manufacture including a non-transitory, tangible computer readable storage medium having instructions stored thereon that, in response to execution by a computer based system, cause the computer based system to perform operations comprising:

generating, by the computer based system, an account hash, ~~wherein the account hash comprises~~ comprising a cryptographic hash of at least one data element from a merchant-stored transaction account data;

invoking, by the computer based system, a maintenance smart contract to determine that the account hash matches a primary account hash or a past account hash that is associated with the primary account hash, the primary account hash and the past account hash being stored in a distributed ledger, the past account hash having a primary hash designation prior to the primary account hash being written to the distributed ledger, and the maintenance smart contract being invoked by ~~passing-sending~~ the account hash and at least one data element from the merchant-stored transaction account data to the maintenance smart contract;

~~wherein in response to being invoked the maintenance smart contract is configured to determine whether the account hash matches a stored primary account hash or a stored past account hash, and~~

~~wherein~~

receiving, by the computer based system, an updated account hash from the maintenance smart contract in response to the maintenance smart contract determining that the account hash matches the stored-past account hash instead of the primary account hash, the updated account hash corresponding to the primary account hash; ~~the maintenance smart contract is configured to return an associated primary account hash to the computer based system;~~

transmitting, by the computer based system, the ~~associated primary~~ updated account hash and the account hash to an issuer system,

~~wherein in response to receiving the associated primary account hash and the account hash the issuer system is-being~~ configured to determine an updated transaction account data based at least in part on the associated primary- updated account hash in response to receiving the updated account hash and the account hash; and

updating, by the computer based system, the merchant-stored transaction account data based at least in part on the updated transaction account data from the issuer system.

~~816. The article of manufacture of claim 715, wherein the computer based system is configured to generate the account hash in response to receiving a transaction request, and wherein, when executed, the instructions further cause the computer based system to perform the operations comprising authorizing a transaction request in response to receiving the updated transaction account data from the issuer system, the computer based system is configured to authorize the transaction request.~~

~~17. The article of manufacture of claim 15 or 16, further comprising:~~

~~—— receiving, by the computer based system, an account on file request comprising the merchant stored transaction account data;~~

~~—— generating, by the computer based system, a stored account hash, wherein the stored account hash comprises a cryptographic hash of at least one data element from the merchant stored transaction account data; and~~

~~—— invoking, by the computer based system, the maintenance smart contract by passing the stored account hash and at least one data element from the merchant stored transaction account data;~~

~~—— wherein in response to being invoked, the maintenance smart contract is configured to write the stored account hash and the at least one data element from the merchant stored transaction account data to an maintained accounts blockchain.~~

~~18. The article of manufacture of claim 17, wherein in response to writing to the maintained accounts blockchain, the maintenance smart contract is configured to notify the issuer system of the write, and wherein the issuer system is configured to validate the write to the maintained accounts blockchain by determining whether the stored account hash and the at least one data element from the merchant stored transaction account are up to date.~~

~~19. The article of manufacture of any of claims 15–18, wherein:~~

~~the issuer system is configured to generate an issuer account hash in response to receiving a transaction account update request;~~

~~—— the issuer account hash comprises a cryptographic hash of at least one data element from an issuer stored transaction account data;~~

~~—— the issuer system is configured to invoke the maintenance smart contract by passing the issuer account hash and at least one data element from the issuer stored transaction account data;~~
~~and~~

~~—— in response to being invoked, the maintenance smart contract is configured to write the issuer account hash and the at least one data element from the issuer stored transaction account data to the maintained accounts blockchain.~~

~~20. The article of manufacture of claim 19, further comprising:~~

~~—— retrieving, by the computer based system, the issuer account hash and the at least one data element from the issuer stored transaction account data from the maintained accounts blockchain;~~
~~and~~

~~—— updating, by the computer based system, the merchant stored transaction account data based on the issuer stored transaction account data.~~

9. The method of any one of claims 1 to 3, further comprising receiving, via the processor, a transaction request via a user account interacting with a user interface of a merchant system, the account hash being generated in response to the transaction request.

10. The method of any one of claims 1 to 3 and 9, further comprising retrieving, via the processor, the merchant-stored transaction account data from a local repository associated with a merchant system.

11. The method of any one of claims 1, 2, 3, 9, and 10, wherein invoking the maintenance smart contract further comprises passing a merchant credential associated with a merchant system

to the maintenance smart contract, the merchant credential being obtained from credential issuing authority.

12. The method of any one of claims 1 to 3 and 9 to 11, wherein transmitting the updated account hash and the account hash to the issuer system comprises invoking a private smart contract to establish a communication between a merchant system and the issuer system.

13. The system of any one of claims 4 to 6, wherein, when executed, the instructions further cause the processor to perform the operations comprising receiving a transaction request via a user account interacting with a user interface of a merchant system, the account hash being generated in response to the transaction request.

14. The system of any one of claims 4, 5, 6, and 13, wherein, when executed, the instructions further cause the processor to perform the operations comprising retrieving the merchant-stored transaction account data from a local repository associated with a merchant system.

15. The system of any one of claims 4, 5, 6, 13, and 14, wherein invoking the maintenance smart contract further comprises sending a merchant credential associated with a merchant system to the maintenance smart contract, the merchant credential being obtained from credential issuing authority.

16. The system of any one of claims 4, 5, 6, 13, 14, and 15, wherein transmitting the updated account hash and the account hash to the issuer system comprises invoking a private smart contract to establish a communication between a merchant system and the issuer system.

17. The article of manufacture of any one of claims 7 and 8, wherein, when executed, the instructions further cause the computer-based system to perform the operations comprising receiving a transaction request via a user account interacting with a user interface of a merchant system, the account hash being generated in response to the transaction request.

18. The article of manufacture of any one of claims 7, 8, and 17, wherein, when executed, the instructions further cause the computer-based system to perform the operations comprising retrieving the merchant-stored transaction account data from a local repository associated with a merchant system.

19. The article of manufacture of any one of claims 7, 8, 17, and 18, wherein invoking the maintenance smart contract further comprises passing a merchant credential associated with a merchant system to the maintenance smart contract, the merchant credential being obtained from credential issuing authority.

20. The article of manufacture of any one of claims 7, 8, 17, 18, and 19, wherein transmitting the updated account hash and the account hash to the issuer system comprises invoking a private smart contract to establish a communication between a merchant system and the issuer system.