

BLOCKCHAIN-BASED DATA PROCESSING METHOD, APPARATUS, AND ELECTRONIC DEVICE

TECHNICAL FIELD

[0001] One or more embodiments of the present application relate to the
5 blockchain field, and in particular, to data processing methods, apparatuses, and
electronic devices.

BACKGROUND

[0002] A blockchain technology, also referred to as a distributed ledger
technology, is a new technology in which a plurality of computing devices participate
10 in "accounting" to maintain a complete distributed database. The blockchain
technology has been widely used in many fields because of its features such as
decentralization, openness and transparency, and participation of each computing
device in recording data in a database, and fast data synchronization between
computing devices.

SUMMARY

[0003] The present application provides a blockchain-based data processing
method, where the blockchain stores a plurality of types of service data related to a
target service, the service data includes at least data content, and source data
referenced by the service data; and the method includes: obtaining authentication root
15 data related to a target service, where the authentication root data is pre-authenticated
and carries a data proof indicating that the data authentication is passed; determining
first data referencing the authentication root data among the plurality of types of
service data, second data referencing the first data, and so on, until a data reference
relationship between the plurality of types of service data is obtained; and organizing,
20 based on the data reference relationship, the authentication root data and the plurality
of types of service data into a service data chain that uses the authentication root data
as a root node.

[0004] The present application further provides a blockchain-based data

CLAIMS

~~What is claimed is:~~

1. A blockchain-based data processing method applied to an application client device
5 configured to interact with a blockchain, wherein the blockchain stores a plurality of types of
service data related to a target service; in the form of a plurality of transactions, wherein the
data structure of each service data comprises at least of the plurality of types of service data
includes data content, and of the service data and a data digest of source data referenced by the
service data; wherein the plurality of transactions are stored in blocks of the blockchain,
10 comprise, for each service data of the plurality of types of service data, a transaction carrying
the service data, and are constructed by service nodes associated with online services deployed
in the blockchain and related to the plurality of types of service data, wherein each transaction
of the plurality of transactions is of a standard format supported by the blockchain extended to
include a reference field filled by the data digest of the source data referenced by the service
15 data carried by the transaction, wherein the method comprises:

obtaining (102) authentication root data related to ~~a~~the target service, wherein the authentication root data is pre-authenticated and carries a data proof indicating that ~~the~~ data authentication is passed;

- determining (104) first service data referencing the authentication root data among the
20 plurality of types of service data, second service data referencing the first service data, and so
on, ~~until to obtain~~ a data reference relationship between the plurality of types of service data ~~is~~
obtained; and,

~~organizing, based on the data reference relationship, the authentication root data and the~~
~~plurality of types of service data into a service data chain that uses the authentication root data~~
25 ~~as a root node.~~

~~2. The method according to claim 1, further comprising:~~

~~receiving a service verification request related to the target service; and~~

~~performing a service verification for the target service based on the service data chain~~
~~in response to the service verification request, and returning a service verification result.~~

3. ~~The method according to claim 1, wherein the service data comprises data content and~~
30 ~~a data digest of the source data referenced by the service data.~~

4. ~~The method according to claim 3, wherein determining first service data referencing~~
the authentication root data among the plurality of types of service data comprises:

initiating a query to the blockchain by using a data digest of the authentication root data as a query index; and

when it is determined that ~~the data digest of the source data referenced by any~~ there is a transaction carrying a target service data ~~in~~ among the plurality of transactions carrying the plurality of types of service data, the reference field of which comprises a data digest of source data referenced by the target service data that matches the data digest of the authentication root data, determining that the target service data is the first service data referencing the authentication root data; and wherein determining the second service data referencing the first service data comprises a same process as the determining the first service data referencing the authentication root data among the plurality of types of service data but using a data digest of the transaction carrying the first service data as the query index instead of the data digest of the authentication root data; organizing (106), based on the obtained data reference relationship, the authentication root data and the plurality of types of service data into a service data chain that uses the authentication root data as a root node; receiving a service verification request related to the target service; performing a service verification for the target service based on the service data chain in response to the service verification request by tracing data in the service data chain based on the obtained data reference relationship; and returning a service verification result.

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2. The method according to claim 1, wherein the authentication root data is stored in the blockchain or a third-party storage system interfaced with the blockchain.

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3. The method according to claim 1, wherein the plurality of types of service data are stored in different child chains in the blockchain.

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4. The method according to claim 2, wherein the target service comprises a real property rental service;

the authentication root data comprises property title data that is pre-authenticated by a real property certification authority; and

the plurality of types of service data comprise real property number data referencing the property title data, rental contract data referencing the real property number data, smart device data referencing the real property number data, and smart device operation data

referencing the smart device data and the rental contract data, wherein the smart device operation data is used to determine ~~the~~an active time of ~~the~~a tenant in ~~the~~a rented real property.

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5. The method according to claim ~~7~~4, wherein the service verification for the target service

5 comprises any one of the following:

trusted real property verification for the real property rental service;

trusted tenant verification for the real property rental service; or

trusted rental credit verification for the real property rental service, wherein ~~the~~ rental credits are issued by the tenant to the tenant when the active time of the tenant in the rented real property reaches a threshold.

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~~9. A blockchain based data processing apparatus, wherein the blockchain stores a plurality of types of service data related to a target service, the service data comprises at least data content, and source data referenced by the service data; and the apparatus comprises:~~

~~an acquisition module, configured to obtain authentication root data related to a target service, wherein the authentication root data is pre-authenticated and carries a data proof indicating that the data authentication is passed;~~

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~~a determining module, configured to determine first data referencing the authentication root data among the plurality of types of service data, second data referencing the first data, and so on, until a data reference relationship between the plurality of types of service data is obtained; and~~

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~~an organizing module, configured to organize, based on the data reference relationship, the authentication root data and the plurality of types of service data into a service data chain that uses the authentication root data as a root node.~~

~~10. The apparatus according to claim 9, further comprising:~~

~~a receiving module, configured to receive a service verification request related to the target service; and~~

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~~a verification module, configured to perform a service verification for the target service based on the service data chain in response to the service verification request, and return a service verification result.~~

~~11. The apparatus according to claim 9, wherein the service data comprises data content and a data digest of the source data referenced by the service data.~~

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~~12. The apparatus according to claim 11, wherein the determining module is further configured to:~~

~~initiate a query to the blockchain by using a data digest of the authentication root data as~~

a query index; and

when it is determined that the data digest of the source data referenced by any target service data in the plurality of types of service data matches the data digest of the authentication root data, determine that the target service data is the first data referencing the authentication root data.

13. The apparatus according to claim 9, wherein the authentication root data is stored in the blockchain or a third party storage system interfaced with the blockchain.

14. The apparatus according to claim 9, wherein the plurality of types of service data are stored in different child chains in the blockchain.

15. The apparatus according to claim 10, wherein the target service comprises a real property rental service;

the authentication root data comprises property title data that is pre-authenticated by a real property certification authority; and

the plurality of types of service data comprise real property number data referencing the property title data, rental contract data referencing the real property number data, smart device data referencing the real property number data, and smart device operation data referencing the smart device data and the rental contract data, wherein the smart device operation data is used to determine the active time of the tenant in the rented real property.

16. The apparatus according to claim 15, wherein the service verification for the target service comprises any one of the following:

trusted real property verification for the real property rental service;

trusted tenant verification for the real property rental service; or

trusted rental credit verification for the real property rental service, wherein the rental credits are issued by the tenant to the tenant when the active time of the tenant in the rented real property reaches a threshold.

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6. An electronic device, comprising:

a processor; and

a memory, configured to store machine executable instructions; wherein

wherein, by reading and executing the machine executable instructions that are stored in the memory and that correspond to a control logic for blockchain-based data processing, the processor is enabled to: perform a method according to any one of the preceding claims.

obtain authentication root data related to a target service, wherein the authentication root

~~data is pre-authenticated and carries a data proof indicating that the data authentication is passed;~~

~~determine first data referencing the authentication root data among the plurality of types of service data, second data referencing the first data, and so on, until a data reference relationship between the plurality of types of service data is obtained; and~~

~~organize, based on the data reference relationship, the authentication root data and the plurality of types of service data into a service data chain that uses the authentication root data as a root node.~~

10 7. A computer-readable storage medium comprising instructions stored thereon which, when executed by a processor of an electronic device, cause the processor to carry out a method according to any one of claims 1 to 5.

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