

WHAT IS CLAIMED IS:

1. A service flow system, comprising a management server, a distributed storage cluster and a block chain alliance network connected by a network, the block chain alliance network comprising a consensus node and at least one participant node, wherein:

a participant node is configured to, in response to receiving a first chaining request comprising to-be-chained data, a participated project identity and a participation phase identity, send the first chaining request and participant authentication information of the participant node as a second chaining request to the management server project;

the management server is configured to, in response to a success in verification of the second chaining request received from the participant node, store the to-be-chained data into the distributed storage cluster; query, in the distributed storage cluster, respective participant information of a phase indicated by a participation phase identity of an project indicated by the participated project identity in the received second data chaining request; determine participant node identities in the queried participant information as a target participant node identity set; send to the consensus node the digest information of the to-be-chained data, the participant node identity of the participant node sending the received second data chaining request, the participated project identity and participation phase identity in the received second data chaining request, and the target participant node identity set as a third chaining request; and record a corresponding relationship between the to-be-chained

data stored in the distributed storage cluster and the third chaining request sent to the consensus node;

the consensus node is configured to, in response to receiving the third chaining request sent by the management server, store the received third chaining request to a local chaining request buffer pool; select, according to a preset consensus algorithm, a to-be-chained request from the local chaining request buffer pool; and send, for the selected to-be-chained request, data except the target participant identity set in the selected to-be-chained request as a fourth chaining request to participant nodes indicated by respective participant node identities in the target participant identity set in the selected to-be-chained request;

the participant nodes are configured to connect, in response to receiving the fourth chaining request sent by the consensus node, the received fourth chaining request to a local block chain.

2. The system according to claim 1, wherein the management server is configured to, in response to a success in verification of the second chaining request received from the participant node, store to-be-chained data to the distributed storage cluster, comprising:

the management server is configured to: in response to a success in verification of participant authentication information in the second chaining request received from the participant node, query in the distributed storage cluster to determine whether participant node identity corresponding to the received participant authentication information is in the participant node identities of the participant information of the phase indicated by the participation

phase identity of the project indicated by the received participated project identity; and determine, in response to determining that the participant node identity corresponding to the received participant authentication information is in the participant node identities of the participant information of the phase indicated by the participation phase identity of the project indicated by the received participated project identity, that the second chaining request received from the participant node succeeds in verification.

3. The system according to claim 2, wherein:

the management server is configured to, in response to receiving a new project creating request comprising to-be-created project information, store the to-be-created project information to the distributed storage cluster, the to-be-created project information comprising an project identity of a to-be-created project and phase information, the phase information being of a number of project phases comprised in the project, the phase information comprising a phase identity and participant information, the participant information being of a number of participants participating in an project phase, and the participant information comprising a participant node identity; determine participant node identities in participant information comprised in respective phase information of the to-be-created project information as a target participant node identity set; send to the consensus node digest information of the to-be-created project information and the target participant node identity set as a third chaining request; and record a corresponding relationship between the to-be-created project information stored in the distributed storage cluster

and the third chaining request sent to the consensus node.

4. The system according to claim 3, wherein:

the participant node is configured to query in the local block chain, in response to a success in verification of an on-chain access request including a to-be-accessed on-chain data identity received from a terminal, data corresponding to the to-be-accessed on-chain data identity, and send found data to the terminal.

5. The system according to any one of claims 1-4, wherein:

the management server is configured to: in response to receiving an off-chain access request sent by a terminal and comprising a to-be-accessed off-chain data identity, a to-be-accessed project identity, a to-be-accessed phase identity and request access participant authentication information, query in the distributed storage cluster to determine whether participant node identity corresponding to received request participant authentication information is in participant node identities of respective participant information of a phase indicated by a to-be-accessed phase identity of an project indicated by the received to-be-accessed project identity ; and in response to determining that the participant node identity corresponding to the received request participant authentication information is in the participant node identities of the respective participant information of the phase indicated by the to-be-accessed phase identity of the project indicated by the received to-be-accessed project identity, query, in the distributed storage cluster, data corresponding to the to-be-accessed off-chain data identity, and send

found data to the terminal.

6. A service data processing method, applied to a management server in a service flow system, wherein the service flow system comprises the management server, a distributed storage cluster and a block chain alliance network connected by a network, the block chain alliance network comprises a consensus node and at least one participant node, and the method comprises:

storing, in response to a success in verification of a second chaining request received from a participant node, to-be-chained data included in the second chaining request into the distributed storage cluster;

querying, in the distributed storage cluster, respective participant information of a phase indicated by a participation phase identity of an project indicated by a participated project identity in the received second data chaining request;

determining participant node identities in the queried participant information as a target participant node identity set;

sending to the consensus node the digest information of the to-be-chained data, the participant node identity of the participant node sending the received second data chaining request, the participated project identity and participation phase identity in the received second data chaining request, and the target participant node identity set as a third chaining request; and

recording a corresponding relationship between the to-be-chained data stored in the distributed storage cluster and the third chaining request sent to the consensus node.

7. The method according to claim 6, wherein the in response to a success in verification of the second chaining request received from a participant node comprises:

in response to a success in verification of participant authentication information in the second chaining request received from the participant node, query in the distributed storage cluster to determine whether participant node identity corresponding to the received participant authentication information is in the participant node identities of the participant information of the phase indicated by the participation phase identity of the project indicated by the received participated project identity; and

in response to determining that the participant node identity corresponding to the received participant authentication information is in the participant node identities of the participant information of the phase indicated by the participation phase identity of the project indicated by the received participated project identity, determining that the second chaining request received from the participant node succeeds in verification.

8. The method according to claim 7, wherein the method further comprises:

in response to receiving a new project creating request comprising to-be-created project information, storing the to-be-created project information into the distributed storage cluster, the to-be-created project information comprising an project identity of a to-be-created project and phase information, the phase information being of a number of project phases comprised in the project, the phase information

comprising a phase identity and participant information,
the participant information being of a number of
participants participating in an project phase, and the
participant information comprising a participant node
identity;

determining participant node identities in
participant information comprised in respective phase
information of the to-be-created project information as
a target participant node identity set;

sending to the consensus node digest information of
the to-be-created project information and the target
participant node identity set as a third chaining
request; and

recording a corresponding relationship between the
to-be-created project information stored in the
distributed storage cluster and the third chaining
request sent to the consensus node.

9. The method according to any one of claims 6-8, wherein
the method further comprises:

in response to receiving an off-chain access request
sent by a terminal and comprising a to-be-accessed off-
chain data identity, a to-be-accessed project identity,
a to-be-accessed phase identity and request access
participant authentication information, querying in the
distributed storage cluster to determine whether
participant node identity corresponding to received
request participant authentication information is in the
participant node identities of respective participant
information of a phase indicated by a to-be-accessed
phase identity of an project indicated by the received
to-be-accessed project identity; and

in response to determining that the participant node identity corresponding to the received request participant authentication information is in the participant node identities of the respective participant information of the phase indicated by the to-be-accessed phase identity of the project indicated by the received to-be-accessed project identity, querying, in the distributed storage cluster, data corresponding to the to-be-accessed off-chain data identity, and sending found data to the terminal.

10. A service data processing apparatus, applied to a management server in a service flow system, wherein the service flow system comprises the management server, a distributed storage cluster and a block chain alliance network connected by a network, the block chain alliance network comprises a consensus node and at least one participant node, and the apparatus comprises:

a first storage unit, configured to store, in response to a success in verification of a second chaining request received from a participant node, to-be-chained data included in the second chaining request into the distributed storage cluster;

a query unit, configured to query, in the distributed storage cluster, respective participant information of a phase indicated by a participation phase identity of an project indicated by a participated project identity in the received second data chaining request;

a first target participant determining unit, configured to determine participant node identities in the queried participant information as a target

participant node identity set;

5 a first sending unit, configured to send to the consensus node the digest information of the to-be-chained data, the participant node identity of the participant node sending the received second data chaining request, the participated project identity and participation phase identity in the received second data chaining request, and the target participant node identity set as a third chaining request; and

10 a first recording unit, configured to record a corresponding relationship between the to-be-chained data stored in the distributed storage cluster and the third chaining request sent to the consensus node.

11. The apparatus according to claim 10, wherein the in
15 response to a success in verification of the second chaining request received from a participant node comprises:

20 in response to a success in verification of participant authentication information in the second chaining request received from the participant node, query in the distributed storage cluster to determine whether participant node identity corresponding to the received participant authentication information is in the participant node identities of the participant
25 information of the phase indicated by the participation phase identity of the project indicated by the received participated project identity; and

30 in response to determining that the participant node identity corresponding to the received participant authentication information is in the participant node identities of the participant information of the phase

indicated by the participation phase identity of the project indicated by the received participated project identity, determining that the second chaining request received from the participant node succeeds in verification.

12. The apparatus according to claim 11, wherein the apparatus further comprises:

a second storage unit, configured to store, in response to receiving a new project creating request comprising to-be-created project information, the to-be-created project information into the distributed storage cluster, the to-be-created project information comprising an project identity of a to-be-created project and phase information, the phase information being of a number of project phases comprised in the project, the phase information comprising a phase identity and participant information, the participant information being of a number of participants participating in an project phase, and the participant information comprising a participant node identity;

a second target participant determining unit, configured to determine participant node identities in participant information comprised in respective phase information of the to-be-created project information as a target participant node identity set;

a second sending unit, configured to send to the consensus node digest information of the to-be-created project information and the target participant node identity set as a third chaining request; and

a second recording unit, configured to record a corresponding relationship between the to-be-created

project information stored in the distributed storage cluster and the third chaining request sent to the consensus node.

13. The apparatus according to any one of claims 10-12,
5 wherein the apparatus further comprises:

a request participant determining unit, configured to: in response to receiving an off-chain access request sent by a terminal and comprising a to-be-accessed off-chain data identity, a to-be-accessed project identity,
10 a to-be-accessed phase identity and request access participant authentication information, query in the distributed storage cluster to determine whether participant node identity corresponding to received request participant authentication information is in the
15 participant node identities of respective participant information of a phase indicated by a to-be-accessed phase identity of an project indicated by the received to-be-accessed project identity; and

a third sending unit configured to: in response to
20 determining that the participant node identity corresponding to the received request participant authentication information is in the participant node identities of the respective participant information of the phase indicated by the to-be-accessed phase identity
25 of the project indicated by the received to-be-accessed project identity, querying, in the distributed storage cluster, data corresponding to the to-be-accessed off-chain data identity, and send found data to the terminal.

- 30 14. A server, comprising:

one or more processors; and

a storage apparatus, storing one or more programs,

the one or more programs, when executed by the one or more processors, causing the one or more processors to implement the method according to any one of claims 6-9.

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15. A computer-readable storage medium, storing a computer program thereon, wherein the computer program, when executed by one or more processors, causes the processors to implement the method according to any one of claims 6-9.

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16. A computer program comprising instructions which, when the program is executed by one or more processors, cause the one or more processors to carry out the method according to any one of claims 6-9.

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