

CLAIMS

What is claimed is:

1. A method, comprising:
 - constructing a consortium blockchain network through acts including:
 - invoking, by a to-be-connected node, a smart contract;
 - determining, by the to-be-connected node, through the smart contract, whether a member node exists in the consortium blockchain network;
 - in response to no member node existing in the consortium blockchain network, activating, by the to-be-connected node, membership right of the to-be-connected node through the smart contract to become a member node of the consortium blockchain network;
 - in response to at least one member node existing in the consortium blockchain network, sending, by the to-be-connected node, a connection request to the at least one existing member node in the consortium blockchain network by using the smart contract;
 - invoking, by each of the at least one existing member node in the consortium blockchain network, the smart contract, to determine, through the smart contract, whether a connection condition in the smart contract is satisfied with respect to the to-be-connected node; and
 - in response to determining, through the smart contract, that each of the at least one existing member node reaches a consensus that the connection condition is satisfied, activating, by the to-be-connected node, the membership right of the to-be-connected node to become a member node of the consortium blockchain network;
 - receiving, by a target member node of the consortium blockchain network, a request for storing a record for a target copyright event in a blockchain, the target copyright event corresponding to a service on a work of authorship performed by a server of a work service provider that controls the target member node;
 - constructing a transaction related to the target copyright event based on the request;

broadcasting the transaction to member nodes of the consortium blockchain network for each member node to add the transaction to a respective copy of the blockchain based on a consensus mechanism of the consortium blockchain network; and

adding the transaction to a copy of the blockchain stored at the target member node based on the consensus mechanism.

2. The method according to claim 1, wherein,

the smart contract provides a plurality of work types, and for each work type of the plurality of work types, the smart contract provides a type identifier and a threshold and a cumulative value corresponding to the type identifier;

the connection request includes a first type identifier and a first weight value corresponding to the first type identifier;

the connection condition includes:

for the first type identifier included in the connection request, a sum of the first weight value and a first cumulative value corresponding to the first type identifier being not greater than a first threshold corresponding to the first type identifier; and

in response to the connection condition being satisfied, the constructing the consortium blockchain network includes:

for the first type identifier included in the connection request, obtaining, by each member node through the smart contract, the sum of the first weight value and the first cumulative value as an updated cumulative value corresponding to the first type identifier.

3. The method according to claim 1, wherein,

the smart contract provides a plurality of work types, and for each work type, the smart contract provides a type identifier and a threshold and a cumulative value corresponding to the type identifier;

the connection request includes a first type identifier and a first weight value corresponding to the first type identifier;

the connection condition includes:

for the first type identifier included in the connection request, a first cumulative value corresponding to the first type identifier is less than a first threshold corresponding to the first type identifier; and

in response to the connection condition being satisfied, the constructing the consortium blockchain network includes:

determining, by each member node through the smart contract, a difference between the first threshold and the first cumulative value corresponding to the first type identifier;

determining, through the smart contract, whether the first weight value is greater than the difference;

in response to the first weight value being greater than the difference, obtaining, through the smart contract, a sum of the difference and the first cumulative value as an updated cumulative value corresponding to the first type identifier; and

in response to the first weight value not being greater than the difference, obtaining, through the smart contract, a sum of the first weight value and the first cumulative value as the updated cumulative value corresponding to the first type identifier.

4. The method of claim 2, wherein the cumulative value corresponding to the type identifier of each work type is a sum of weight values of member nodes that exist in the consortium blockchain network for the work type.

5. An apparatus of a first member node of a consortium blockchain network, the consortium blockchain network having a plurality of member nodes including the first member node, the apparatus comprising a processor and a memory, the memory storing computer executable instructions that are executed by the processor to implement:

a receiving module that receives a request for storing a record for a target copyright event in a blockchain, the target copyright event corresponding to a service on a work of authorship performed by a server of a work service provider that controls the target member node;

a transaction construction module that constructs a transaction related to the target copyright event based on the request; and

a broadcasting module that broadcasts the transaction to member nodes of the consortium blockchain network for each member node to add the transaction to a respective copy of the blockchain based on a consensus mechanism of the consortium blockchain network, wherein the consortium blockchain network is constructed through acts including:

invoking, by a to-be-connected node, a smart contract;

determining, by the to-be-connected node through the smart contract, whether a member node exists in the consortium blockchain network;

in response to no member node existing in the consortium blockchain network, activating, by the to-be-connected node, membership right of the to-be-connected node through the smart contract to become a member node of the consortium blockchain network;

in response to at least one member node existing in the consortium blockchain network, sending, by the to-be-connected node, a connection request to the at least one existing member node in the consortium blockchain network by using the smart contract;

invoking, by each of the at least one existing member node in the consortium blockchain network, the smart contract, to determine, through the smart contract, whether a connection condition in the smart contract is satisfied with respect to the to-be-connected node; and

in response to determining, through the smart contract, that each of the at least one existing member node reaches a consensus that the connection condition is satisfied, activating, by the to-be-connected node, the membership right of the to-be-connected node to become a member node of the consortium blockchain network.

6. The apparatus according to claim 5, wherein,

the smart contract provides a plurality of work types, and for each work type of the plurality of work types, the smart contract provides a type identifier and a threshold and a cumulative value corresponding to the type identifier;

the connection request includes a first type identifier and a first weight value corresponding to the first type identifier;

the connection condition includes:

for the first type identifier included in the connection request, a sum of the first weight value and a first cumulative value corresponding to the first type identifier is not greater than a first threshold corresponding to the first type identifier; and

in response to the connection condition being satisfied, the constructing the consortium blockchain network includes:

for the first type identifier included in the connection request, obtaining, by each member node through the smart contract, the sum of the first weight value and the first cumulative value corresponding to the first type identifier as an updated cumulative value corresponding to the first type identifier.

7. The apparatus according to claim 5, wherein,

the smart contract provides a plurality of work types, and for each work type, the smart contract provides a type identifier and a threshold and a cumulative value corresponding to the type identifier;

the connection request includes a first type identifier and a first weight value corresponding to the first type identifier;

the connection condition includes:

for the first type identifier included in the connection request, a first cumulative value corresponding to the first type identifier is less than a first threshold corresponding to the first type identifier; and

in response to the connection condition being satisfied, the constructing the consortium blockchain network includes:

for the first type identifier included in the connection request, determining, by each member node through the smart contract, a difference between the first threshold and the first cumulative value corresponding to the first type identifier;

determining, through the smart contract, whether the first weight value is greater than the difference;

in response to the first weight value being greater than the difference, obtaining, through the smart contract, a sum of the difference and the first cumulative value as an updated cumulative value corresponding to the first type identifier; and

in response to the first weight value not being greater than the difference, obtaining, through the smart contract, a sum of the first weight value and the first cumulative value as the updated cumulative value corresponding to the first type identifier.

8. The apparatus of claim 6, wherein the cumulative value corresponding to the type identifier of each work type is a sum of weight values of member nodes that exist in the consortium blockchain network for the work type.

9. A system, comprising a consortium blockchain network having a plurality of member nodes of computing devices,

wherein the system constructs the consortium blockchain network through acts including:

invoking, by a to-be-connected node, a smart contract deployed on the system;

determining, by the to-be-connected node, through the smart contract, whether a member node exists in the consortium blockchain network;

in response to no member node existing in the consortium blockchain network, activating, by the to-be-connected node, membership right of the to-be-connected node through the smart contract to become a member node of the consortium blockchain network;

in response to at least one member node existing in the consortium blockchain network, sending, by the to-be-connected node, a connection request to the at least one existing member node in the consortium blockchain network by using the smart contract;

invoking, by each of the at least one existing member node in the consortium blockchain network, the smart contract, to determine, through the smart contract, whether

a connection condition in the smart contract is satisfied with respect to the to-be-connected node; and

in response to determining, through the smart contract, that each of the at least one existing member node reaches a consensus that the connection condition is satisfied, activating, by the to-be-connected node, the membership right of the to-be-connected node to become a member node of the consortium blockchain network, and

wherein in operation:

a target member node of the plurality of member nodes receives a request for storing a record for a target copyright event generated based on a work-related service performed by a server of a work service provider that controls the target member node; constructs a transaction related to the target copyright event based on the request; and broadcasts the transaction to member nodes of the consortium blockchain network; and

each member node of the consortium blockchain network adds the transaction to the blockchain based on a consensus mechanism of the consortium blockchain network.

10. The system according to claim 9, wherein,

the smart contract provides a plurality of work types, and for each work type of the plurality of work types, the smart contract provides a type identifier and a threshold and a cumulative value corresponding to the type identifier;

the connection request includes a first type identifier and a first weight value corresponding to the first type identifier;

the connection condition includes:

for the first type identifier included in the connection request, a sum of the first weight value and a first cumulative value corresponding to the first type identifier being not greater than a first threshold corresponding to the first type identifier; and

in response to the connection condition being satisfied, the constructing the consortium blockchain network includes:

for the first type identifier included in the connection request, obtaining, by each member node through the smart contract, the sum of the first weight

value and the first cumulative value as an updated cumulative value corresponding to the first type identifier.

11. The system according to claim 9, wherein the smart contract provides a plurality of work types, and for each work type, the smart contract provides a type identifier and a threshold and a cumulative value corresponding to the type identifier;

the connection request includes a first type identifier of the plurality of type identifiers and a first weight value corresponding to the first type identifier;

the connection condition includes:

for the first type identifier included in the connection request, a first cumulative value corresponding to the first type identifier is less than a first threshold corresponding to the first type identifier; and

in response to the connection condition being satisfied, the constructing the consortium blockchain network includes:

determining, by each member node through the smart contract, a difference between the first threshold and the first cumulative value corresponding to the first type identifier;

determining, through the smart contract, whether the first weight value is greater than the difference;

in response to the first weight value being greater than the difference, obtaining, through the smart contract, a sum of the difference and the first cumulative value as an updated cumulative value corresponding to the first type identifier; and

in response to the first weight value not being greater than the difference, obtaining, through the smart contract, a sum of the first weight value and the first cumulative value as the updated cumulative value corresponding to the first type identifier.

12. The system according to claim 10, wherein the cumulative value corresponding to the type identifier of each work type is a sum of weight values of member nodes that exist in the consortium blockchain network for the work type.

13. A computer device, comprising a memory, a processor, and a computer program that is stored in the memory and executable by the processor, and the processor implementing acts when executing the program, the acts including:

- constructing a consortium blockchain network that includes:
 - invoking, by a to-be-connected node, a smart contract;
 - determining, by the to-be-connected node, through the smart contract, whether a member node exists in the consortium blockchain network;
 - in response to no member node existing in the consortium blockchain network, activating, by the to-be-connected node, membership right of the to-be-connected node through the smart contract to become a member node of the consortium blockchain network;
 - in response to at least one member node existing in the consortium blockchain network, sending, by the to-be-connected node, a connection request to the at least one existing member node in the consortium blockchain network by using the smart contract;
 - invoking, by each of the at least one existing member node in the consortium blockchain network, the smart contract, to determine, through the smart contract, whether a connection condition in the smart contract is satisfied with respect to the to-be-connected node; and
 - in response to determining, through the smart contract, that each of the at least one existing member node reaches a consensus that the connection condition is satisfied, activating, by the to-be-connected node, the membership right of the to-be-connected node to become a member node of the consortium blockchain network;
 - receiving, at a target member node of the consortium blockchain network, a request for storing a record for a target copyright event in a blockchain, the target copyright event corresponding to a service on a work of authorship performed by a server of a work service provider that controls the target member node;
 - constructing a transaction related to the target copyright event based on the request;

broadcasting the transaction to member nodes of the consortium blockchain network for each member node to add the transaction to respective copy of the blockchain based on a consensus mechanism of the consortium blockchain network; and

adding the transaction to a copy of the blockchain stored at the target member node based on the consensus mechanism.

14. The computer device according to claim 13, wherein,

the smart contract provides a plurality of work types, and for each work type of the plurality of work types, the smart contract provides a type identifier and a threshold and a cumulative value corresponding to the type identifier;

the connection request includes a first type identifier and a first weight value corresponding to the first type identifier;

the connection condition includes:

for the first type identifier included in the connection request, a sum of the first weight value and a first cumulative value corresponding to the first type identifier being not greater than a first threshold corresponding to the first type identifier; and

in response to the connection condition being satisfied, the constructing the consortium blockchain network includes:

for the first type identifier included in the connection request, obtaining, by each member node through the smart contract, the sum of the first weight value and the first cumulative value as an updated cumulative value corresponding to the first type identifier.

15. The computer device according to claim 13, wherein the smart contract provides a plurality of work types, and for each work type, the smart contract provides a type identifier and a threshold and a cumulative value corresponding to the type identifier;

the connection request includes a first type identifier of the plurality of type identifiers and a first weight value corresponding to the first type identifier; the connection condition includes:

for the first type identifier included in the connection request, a first cumulative value corresponding to the first type identifier is less than a first threshold corresponding to the first type identifier; and

in response to the connection condition being satisfied, the constructing the consortium blockchain network includes:

determining, by each member node through the smart contract, a difference between the first threshold and the first cumulative value corresponding to the first type identifier;

determining, through the smart contract, whether the first weight value is greater than the difference;

in response to the first weight value being greater than the difference, obtaining, through the smart contract, a sum of the difference and the first cumulative value as an updated cumulative value corresponding to the first type identifier; and

in response to the first weight value not being greater than the difference, obtaining, through the smart contract, a sum of the first weight value and the first cumulative value as the updated cumulative value corresponding to the first type identifier.

16. The computer device according to claim 14, wherein the cumulative value corresponding to the type identifier of each work type is a sum of weight values of member nodes that exist in the consortium blockchain network for the work type.

17. The method according to claim 1, wherein the constructing the transaction related to the target copyright event includes assembling information of the target copyright event using a data structure provided by the consortium blockchain network.

18. The apparatus according to claim 5, wherein the transaction construction module constructs the transaction related to the target copyright event by assembling information of the target copyright event using a data structure provided by the consortium blockchain network.

19. The system according to claim 9, wherein the target member node constructs a transaction related to the target copyright event by assembling information of the target copyright event using a data structure provided by the consortium blockchain network.

20. The computer device according to claim 13, wherein the constructing the transaction related to the target copyright event includes assembling information of the target copyright event using a data structure provided by the consortium blockchain network.