

CLAIMS

What is claimed is:

1. A ~~blockchain based exchange method, comprising: for available resource quotas, wherein a blockchain network comprises~~

~~issuing, by a management node and several object nodes, each object node performing copyright use transactions by using of a blockchain computer network,~~ virtual resources issued to a group of object nodes through a blockchain by the management node as transaction media, and the method comprises wherein:

a smart contract on the blockchain comprises computer code executable to select a plurality of target nodes,

the computer code comprises a selection rule, and

the selection rule comprises a competitiveness representation value algorithm and a number of nodes;

selecting, by the management node, a plurality of the plurality of target nodes from the group of object nodes based on transaction needs and according to the selection rule by invoking the smart contract stored on the blockchain, wherein:

the target nodes are qualified to receive resources quotas, and

selecting the plurality of target nodes comprises:

obtaining, by the management node, an amount of remaining virtual resources of the issued virtual resources corresponding to each of the object nodes as target nodes according to a selection rule from the blockchain;

obtaining, by the management node, an amount of virtual resource increments for the each object node during a time period from the blockchain;

determining, by the management node for each target node, available resource quotas exchanged to the target node, wherein the available resource quotas exchanged to the target node are used for determining earning increments corresponding to the target object node of the group of object nodes, a value weight;

determining virtual resources corresponding to the available each object node based on a proportion of the virtual resource increments to the remaining virtual resources corresponding to the each object node;

determining, by the management node for each object node of the group of object nodes, a competitiveness representation value by using the competitiveness representation value algorithm and the value weight, wherein the competitiveness representation value algorithm

comprises a weighted sum of the amount of the remaining virtual resources corresponding to the each object node and the amount of the virtual resource increments for the each object node;

sorting, by the management node, the group of object nodes in a descending order according to the competitiveness representation value respectively corresponding to the each object node; and

selecting, by the management node, a portion of the group of object nodes as the plurality of target nodes according to the descending order until the number of nodes are selected;

determining, by the management node respectively for the plurality of target nodes, a plurality of resource quotas as;

determining, by the management node respectively for the plurality of target nodes, a plurality of virtual resource decrements corresponding to the plurality of resource quotas target node; and

constructing, by the management node, a quota exchange transaction comprising the determined plurality of virtual resource decrements corresponding to the plurality of target nodes, and

sending, by the management node, publishing the quota exchange transaction to a blockchain one or more blockchain nodes of the blockchain computer network for performing consensus verification on the quota exchange transaction and for, based on the determination that the consensus verification on the quota exchange transaction succeeds, deducting the determined plurality of virtual resource decrements of the quota exchange transaction from a plurality of remaining virtual resources corresponding to the plurality of target nodes by executing the quota exchange transaction.

2. The method according to claim 1, further comprising, before selecting the plurality of target nodes, presetting, by the management node, a plurality of work categories, and for each work category, establishing, by the management node, an association relationship between the group of object nodes and the plurality of work categories, wherein:

selecting the plurality of target nodes comprises: selecting the plurality of target nodes according to a selection rule for each of the plurality of work categories.

3. The method according to claim 1, wherein the selection rule comprises:

an amount of remaining virtual resources corresponding to an object node is not less than a first threshold; and

the remaining virtual resources corresponding to the object node correspond to a

remainder after the virtual resource decrements are deducted from virtual resource increments corresponding to the object node stored on the blockchain.

4. The method according to claim 1, wherein the selection rule comprises:
during a time period, for each object node, an amount of the virtual resource
increments generated based on copyright use transactions is not less than a second threshold.

5. The method according to claim 1, further comprising:
receiving, by the management node from an object node, a refill request comprising a
refill amount;

deducting, by the management node, an amount of property equivalent to virtual
resources of the refill amount from a property account corresponding to the object node;
determining, by the management node, the virtual resources of the refill amount as
virtual resource increments corresponding to the object node; and

constructing, by the management node, a resource refill transaction comprising the
determined virtual resource increments corresponding to the object node, and adding the
resource refill transaction to the blockchain;

wherein the selection rule comprises that: (1) an amount of remaining virtual
resources corresponding to the object node is not less than a first threshold, and (2) a
proportion of virtual resource increments corresponding to the object node being generated
based on resource refill transactions is not greater than a designated proportion.

6. The method according to claim 1, wherein:
for the each object node of the group of object nodes, a larger competitiveness
representation value increases a chance of being selected as a target node.

7. The method according to claim 6, wherein determining, by the management node
for the each object node of the group of object nodes, the competitiveness representation
value by using the competitiveness representation value algorithm comprises:

determining, by the management node for the each object node of the group of object
nodes, the competitiveness representation value by using a characteristic parameter
corresponding to the object node as an input of the competitiveness representation value
algorithm.

8. The method according to claim 7, wherein the characteristic parameter
corresponding to the object node comprises:

(1) the amount of remaining virtual resources corresponding to the each object node,
the virtual resource remaining virtual resources corresponding to the each object node
corresponding to a remainder after the virtual resource decrements are deducted from virtual

resource increments corresponding to the each object node stored on the blockchain;

(2) the proportion of virtual resource increments generated based on copyright use transactions to virtual resources of the amount of remaining virtual resources corresponding to the each object node; and

(3) during the time period, for the each object node, the amount of the virtual resource increments generated based on copyright use transactions.

9. The method according to claim 1, further comprising, before selecting the plurality of target nodes, acquiring by the management node in advance for each object node, an authorization type corresponding to the each object node, the authorization type comprising a consent type, a query type, or a rejection type; and

selecting, by the management node, from the each object node according to the descending order, the one or more object nodes until a preset quantity of target nodes are selected comprises:

when the authorization type is the consent type, determining, by the management node, that a corresponding user agrees to determine the user's object node as the target node;

when the authorization type is the query type, asking, by the management node, whether the corresponding user agrees to determine the user's object node as the target node; and

when the authorization type is the rejection type, determining, by the management node, that the corresponding user does not agree to determine the user's object node as the target node.

10. The method according to claim 1, wherein determining, by the management node respectively for the plurality of target nodes, the plurality of resource quotas comprises:

determining, for each target node, an amount of remaining virtual resources corresponding to the each target nodes as a resource quota.

11. The method according to claim 1, wherein determining, by the management node respectively for the plurality of target nodes, the plurality of resource quotas comprises:

determining a minimum amount of designated remaining virtual resources from a plurality of amounts of designated remaining virtual resources corresponding to the target nodes;

designating, as a minimum amount of remaining virtual resources, an amount not greater than the minimum amount of designated remaining virtual resources; and

determining, for each target node, the minimum amount of remaining virtual resources as a resource quota.

~~2. The method according to claim 1, comprising: presetting a plurality of work categories, and establishing, for each work category, an association relationship between the plurality of object nodes and the work category, wherein~~

~~the selecting, by the management node, a plurality of object nodes as target nodes according to a selection rule comprises:~~

~~for each work category, selecting, by the management node according to the selection rule, the plurality of object nodes as the target nodes from object nodes associated with the work category.~~

~~3. The method according to claim 1, wherein the selecting, by the management node, a plurality of object nodes as target nodes according to a selection rule comprises:~~

~~invoking, by the management node, a smart selection contract that comprises the selection rule and that is stored in the blockchain; and~~

~~selecting the plurality of object nodes as the target nodes through the smart selection contract.~~

~~4. The method according to claim 1, wherein the selecting, by the management node, a plurality of object nodes as target nodes according to a selection rule comprises:~~

~~—determining, by the management node according to the selection rule, an object node that satisfies the selection rule as the target node;~~

~~or~~

~~determining, by the management node according to the selection rule, an object node that satisfies the selection rule; determining, for each object node that satisfies the selection rule, whether a user corresponding to the object node agrees to determine the object node as the target node; and if yes, determining the object node as the target node.~~

~~5. The method according to claim 4, wherein for each object node, that the object node satisfies the selection rule comprises:~~

~~an amount of designated remaining virtual resources corresponding to the object node is not less than a first threshold, wherein the amount of designated remaining virtual resources corresponding to the object node is an amount that is preassigned by the user corresponding to the object node and that is at least a portion of remaining virtual resources corresponding to the object node, and the virtual resource remaining virtual resources corresponding to the object node are virtual resource increments remaining after the virtual resource decrements that correspond to the target node and that are stored in the blockchain are deducted from virtual resource increments that correspond to the object node and that are stored in the blockchain;~~

and/or

~~during a statistical period, an amount of virtual resource increments that correspond to the object node and that are generated based on the copyright use transaction is not less than a second threshold.~~

~~6. The method according to claim 5, wherein the method further comprises:~~

~~receiving, by the management node, a refill request that comprises a refill amount and that is sent by any object node;~~

~~deducting property equivalent to virtual resources corresponding to the refill amount from a property account of the user corresponding to the object node;~~

~~determining virtual resources corresponding to the refill amount as the virtual resource increments corresponding to the object node; and~~

~~constructing a resource refill transaction comprising the determined virtual resource increments corresponding to the object node, and publishing the resource refill transaction to the blockchain; and~~

~~that an amount of designated remaining virtual resources corresponding to the object node is not less than a first threshold comprises:~~

~~the amount of designated remaining virtual resources corresponding to the object node is not less than the first threshold, and a proportion of virtual resource increments generated based on the resource refill transaction to the remaining virtual resources corresponding to the amount of designated remaining virtual resources corresponding to the object node is not greater than a designated proportion.~~

~~7. The method according to claim 1, wherein the selection rule comprises: a competitiveness representation value algorithm; and~~

~~the management node selects the plurality of object nodes as the target nodes according to a selection rule corresponding to a current process, which comprises:~~

~~calculating, by the management node for each object node, a competitiveness representation value corresponding to the object node by using the competitiveness representation value algorithm; and~~

~~selecting a preset quantity of object nodes as the target nodes according to the competitiveness representation values respectively corresponding to the object nodes, wherein~~

~~for each object node, a larger competitiveness representation value corresponding to the object node indicates a higher priority in which the object node is selected as the target node.~~

~~8. The method according to claim 7, wherein the calculating, by the management node~~

for each object node, a competitiveness representation value corresponding to the object node by using the competitiveness representation value algorithm comprises:

~~calculating, by the management node for each object node, the competitiveness representation value corresponding to the object node by using a characteristic parameter corresponding to the object node as an input of the competitiveness representation value algorithm, wherein~~

~~the characteristic parameter corresponding to the object node comprises at least one of the following:~~

~~(1) an amount of designated remaining virtual resources corresponding to the object node, wherein the amount of designated remaining virtual resources corresponding to the object node is an amount that is preassigned by the user corresponding to the object node and that is at least a portion of virtual resource remaining virtual resources corresponding to the object node, and the virtual resource remaining virtual resources corresponding to the object node are virtual resource increments remaining after the virtual resource decrements that correspond to the target node and that are stored in the blockchain are deducted from virtual resource increments that correspond to the object node and that are stored in the blockchain;~~

~~(2) a proportion of virtual resource increments generated based on a copyright use transaction to virtual resources corresponding to the amount of designated remaining virtual resources corresponding to the object node; and~~

~~(3) during a statistical period, an amount of virtual resource increments that correspond to the object node and that are generated based on the copyright use transaction.~~

9. The method according to claim 7, wherein the selecting a preset quantity of object nodes as the target nodes according to the competitiveness representation values respectively corresponding to the object nodes comprises:

~~sorting the object nodes in a descending order of the competitiveness representation values respectively corresponding to the object nodes;~~

~~selecting a first object node;~~

~~determining whether a user corresponding to the object node agrees to determine the object node as the target node; and~~

~~if yes, determining the object node as the target node; or~~

~~if not, not determining the object node as the target node; and~~

~~continuing to select a next object node until the preset quantity of target nodes are determined.~~

10. The method according to claim 4 or 9, wherein the management node pre-obtains,

~~for each object node, a permission type corresponding to the object node, the permission type comprising one of a consent type, a query type, and a rejection type; and~~

~~the determining whether a user corresponding to the object node agrees to determine the object node as the target node comprises:~~

~~if the permission type corresponding to the object node is the consent type, determining that the user corresponding to the object node agrees to determine the object node as the target node;~~

~~if the permission type corresponding to the object node is the query type, querying whether the user corresponding to the object node agrees to determine the object node as the target node; or~~

~~if the permission type corresponding to the object node is the rejection type, determining that the user corresponding to the object node does not agree to determine the object node as the target node.~~

~~11. The method according to claim 1, wherein the determining, for each target node, available resource quotas exchanged to the target node comprises:~~

~~determining, for each target node, an amount of designated remaining virtual resources corresponding to the target node as the available resource quotas exchanged to the target node, wherein the amount of designated remaining virtual resources corresponding to the target node is an amount that is preassigned by a user corresponding to the target node and that is at least a portion of remaining virtual resources corresponding to the target node;~~

~~or~~

~~determining, for each target node, a minimum amount of remaining virtual resources as the available resource quotas exchanged to the target node, wherein~~

~~the minimum amount of remaining virtual resources is determined in the following manner:~~

~~a minimum amount of designated remaining virtual resources is determined from the amounts of designated remaining virtual resources respectively corresponding to the target nodes; and~~

~~an amount not greater than the minimum amount of designated remaining virtual resources is designated as the minimum amount of remaining virtual resources.~~

12. A blockchain-based exchange apparatus for available resource quotas, comprising one or more processors and one or more non-transitory computer-readable storage media storing instructions executable by the one or more processors, wherein execution of the instructions causes the one or more processors to perform operations according to any one of

~~claims 1 to 11, wherein a blockchain network comprises the apparatus and several object nodes, each object node performing copyright use transactions by using virtual resources issued by the apparatus as transaction media, and the apparatus comprises:~~

~~a selection module, configured to select a plurality of object nodes as target nodes according to a selection rule;~~

~~an available resource quota determining module, configured to determine, for each target node, available resource quotas exchanged to the target node, wherein the available resource quotas exchanged to the target node are used for determining earning increments corresponding to the target node;~~

~~a virtual resource decrement determining module, configured to determine virtual resources corresponding to the available resource quotas as virtual resource decrements corresponding to the target node; and~~

~~a construction and publishing module, configured to construct a quota exchange transaction comprising the determined virtual resource decrements corresponding to the target node, and publish the quota exchange transaction to a blockchain.~~

~~13. The apparatus according to claim 12, wherein the apparatus further comprises: a preprocessing module, configured to preset a plurality of work categories, and establish, for each work category, an association relationship between the plurality of object nodes and the work category, wherein~~

~~the selection module is configured to: for each work category, select, according to the selection rule, the plurality of object nodes as the target nodes from object nodes associated with the work category.~~

~~14. The apparatus according to claim 12, wherein the selection module is configured to invoke a smart selection contract that comprises the selection rule and that is stored in the blockchain; and select the plurality of object nodes as the target nodes through the smart selection contract.~~

~~15. The apparatus according to claim 12, wherein the selection module is configured to: determine, according to the selection rule, an object node that satisfies the selection rule as the target node; or determine, according to the selection rule, the object node that satisfies the selection rule; determine, for each object node that satisfies the selection rule, whether a user corresponding to the object node agrees to determine the object node as the target node; and if yes, determine the object node as the target node.~~

~~16. The apparatus according to claim 15, wherein for each object node, that the object~~

~~node satisfies the selection rule comprises:~~

~~an amount of designated remaining virtual resources corresponding to the object node is not less than a first threshold, wherein the amount of designated remaining virtual resources corresponding to the object node is an amount that is preassigned by the user corresponding to the object node and that is at least a portion of virtual resource remaining virtual resources corresponding to the object node, and the virtual resource remaining virtual resources corresponding to the object node are virtual resource increments remaining after the virtual resource decrements that correspond to the target node and that are stored in the blockchain are deducted from virtual resource increments that correspond to the object node and that are stored in the blockchain;~~

~~and/or~~

~~during a statistical period, an amount of virtual resource increments that correspond to the object node and that are generated based on the copyright use transaction is not less than a second threshold.~~

~~17. The apparatus according to claim 16, wherein the apparatus further comprises:~~

~~a refill module, configured to: receive a refill request that comprises a refill amount and that is sent by any object node; deduct property equivalent to virtual resources corresponding to the refill amount from a property account of the user corresponding to the object node; determine virtual resources corresponding to the refill amount as the virtual resource increments corresponding to the object node; and construct a resource refill transaction comprising the determined virtual resource increments corresponding to the object node, and publish the resource refill transaction to the blockchain; and~~

~~that an amount of designated remaining virtual resources corresponding to the object node is not less than a first threshold comprises:~~

~~the amount of designated remaining virtual resources corresponding to the object node is not less than the first threshold, and a proportion of virtual resource increments generated based on the resource refill transaction to the virtual resource remaining virtual resources corresponding to the amount of designated remaining virtual resources corresponding to the object node is not greater than a designated proportion.~~

~~18. The apparatus according to claim 12, wherein the selection rule comprises: a competitiveness representation value algorithm; and~~

~~the selection module is configured to calculate, for each object node, a competitiveness representation value corresponding to the object node by using the competitiveness representation value algorithm; and select a preset quantity of object nodes as the target nodes~~

~~according to the competitiveness representation values respectively corresponding to the object nodes, wherein~~

~~for each object node, a larger competitiveness representation value corresponding to the object node indicates a higher priority in which the object node is selected as the target node.~~

~~1913.~~ A blockchain-based exchange system for available resource quotas, comprising a management node and several object nodes, wherein each object node performs copyright use transactions by using virtual resources issued by the management node as transaction media; and

~~the management node selects a plurality of object nodes as target nodes according to any one of claims 1 to 11—a selection rule; determines, for each target node, available resource quotas exchanged to the target node, wherein the available resource quotas exchanged to the target node are used for determining earning increments corresponding to the target node; determines virtual resources corresponding to the available resource quotas as virtual resource decrements corresponding to the target node; and constructs a quota exchange transaction comprising the determined virtual resource decrements corresponding to the target node, and publishes the quota exchange transaction to a blockchain.~~

~~2014.~~ A computer device comprising a memory, a processor, and a computer program stored in the memory and runnable on the processor, wherein when the processor executes the program, the blockchain-based exchange method for available resource quotas according to any one of claims 1 to 11 is implemented.