

CLAIMS

1. A block processing method, the method being executed by a first node in a blockchain, the blockchain further comprising a second node, the first node being a leader node, the second node being a follower node, and the method comprising:

5 packaging, by the first node, first transaction information in a transaction queue of the first node into a candidate block, and broadcasting the candidate block through the blockchain, wherein the first transaction information in the broadcasted candidate block is not verified by the first node;

10 performing, by the first node, verification on the first transaction information in the candidate block to generate a first verification result, and executing a transaction indicated by the first transaction information in the candidate block to generate a first transaction execution result;

15 broadcasting, by the first node, a first node processing result through the blockchain, the first node processing result comprising the first verification result and the first transaction execution result;

20 receiving, by the first node, a second node processing result broadcast by the second node through the blockchain, the second node processing result comprising a second verification result generated by the second node by performing verification on the first transaction information in the candidate block, and a second transaction execution result generated by the second node by executing the transaction indicated by the first transaction information in the candidate block; and

25 performing, by the first node, consensus on the candidate block according to the first node processing result and the second node processing result, saving, by the first node, the candidate block in a case that a consensus on the candidate block is reached successfully, and saving the first transaction execution result in a case that the transaction indicated by the first transaction information is executed successfully.

2. The method according to claim 1, wherein before the packaging, by the first node, first transaction information in a transaction queue of the first node into a candidate block, the method further comprises:

checking, by the first node, whether the transaction queue meets a preset block generation condition; and

triggering, in a case that the transaction queue meets the block generation condition, the operation of packaging, by the first node, the first transaction information in the transaction queue of the first node into the candidate block.

3. The method according to claim 2, wherein the checking, by the first node, whether the transaction queue meets a preset block generation condition comprises:

checking, by the first node, whether a quantity of pieces of transaction information stored in the transaction queue exceeds a first threshold, determining, in a case that the quantity of pieces of transaction information exceeds the first threshold, that the transaction queue meets the block generation condition, and determining, in a case that the quantity of pieces of transaction information does not exceed the first threshold, that the transaction queue does not meet the block generation condition.

4. The method according to claim 2, wherein the checking, by the first node, whether the transaction queue meets a preset block generation condition comprises:

checking, by the first node, whether a volume of data stored in the transaction queue exceeds a second threshold, determining, in a case that the volume of data exceeds the second threshold, that the transaction queue meets the block generation condition, and determining, in a case that the volume of data does not exceed the second threshold, that the transaction queue does not meet the block generation condition.

5. The method according to claim 2, wherein the checking, by the first node, whether the transaction queue meets a preset block generation condition comprises:

checking, by the first node, whether a time difference between a previous time of generating a block for the transaction queue and a current time exceeds a block generation time threshold, determining, in a case that the time difference exceeds the block generation time threshold, that the transaction queue meets the block generation condition, and determining, in a case that the time difference does not exceed the block generation time threshold, that the transaction queue does not meet the block generation condition.

6. The method according to claim 1, further comprising:

receiving, by the first node, transaction information transmitted by at least one client to the blockchain; or receiving, by the first node, transaction information obtained by the second

node from at least one client; and

putting, by the first node, the transaction information of the at least one client into the transaction queue.

7. The method according to claim 1, further comprising:

5 packaging, by the first node, second transaction information in the transaction queue into the candidate block while packaging the first transaction information into the candidate block, and broadcasting the candidate block through the blockchain;

performing, by the first node, verification on the second transaction information in the candidate block to generate a third verification result, and executing a transaction indicated by
10 the second transaction information in the candidate block to generate a third transaction execution result;

broadcasting, by the first node, a third node processing result through the blockchain, the third node processing result comprising the third verification result and the third transaction execution result;

15 receiving, by the first node, a fourth node processing result broadcast by the second node through the blockchain, the fourth node processing result comprising: a fourth verification result generated by the second node by performing verification on the second transaction information in the candidate block, and a fourth transaction execution result generated by the second node by executing the transaction indicated by the second transaction information in
20 the candidate block; and

performing, by the first node, consensus on the candidate block according to the third node processing result and the fourth node processing result, saving, by the first node, the candidate block in a case that a consensus on the candidate block is reached successfully, and saving the third transaction execution result in a case that the transaction indicated by the
25 second transaction information is executed successfully.

8. The method according to any one of claims 1 to 7, wherein the saving, by the first node, the candidate block in a case that a consensus on the candidate block is reached successfully comprises:

saving, by the first node in a case that a consensus on the candidate block is reached
30 successfully, header information of the candidate block and the first transaction information that is successfully verified.

9. A block processing method, the method being executed by a second node in a blockchain, the blockchain further comprising a first node, the first node being a leader node, the second node being a follower node, and the method comprising:

receiving, by the second node, a candidate block broadcast by the first node through the blockchain, and obtaining first transaction information from the candidate block, wherein the first transaction information in the broadcasted candidate block is not verified by the first node;

performing, by the second node, verification on the first transaction information in the candidate block to generate a second verification result, and executing a transaction indicated by the first transaction information in the candidate block to generate a second transaction execution result;

broadcasting, by the second node, a second node processing result through the blockchain, the second node processing result comprising the second verification result and the second transaction execution result; and

saving, by the second node, the candidate block in a case that the first transaction information is verified successfully, and saving the second transaction execution result in a case that the transaction indicated by the first transaction information is executed successfully.

10. The method according to claim 9, wherein after the broadcasting, by the second node, a second node processing result through the blockchain, the method further comprises:

receiving, by the second node, a first node processing result broadcast by the first node through the blockchain, the first node processing result comprising: a first verification result generated by the first node by performing verification on the first transaction information in the candidate block, and a first transaction execution result generated by the first node by executing the transaction indicated by the first transaction information in the candidate block; and

performing, by the second node, consensus on the candidate block according to the first node processing result and the second node processing result, and triggering, in a case that a consensus on the candidate block is reached successfully, the operation of saving, by the second node, the candidate block in a case that the first transaction information is verified successfully, and the operation of saving the second transaction execution result in a case that the transaction indicated by the first transaction information is executed successfully.

11. The method according to claim 9, wherein after the broadcasting, by the second node, a second node processing result through the blockchain, the method further comprises:

receiving, by the second node, a notification message transmitted by the first node in a case that a consensus on the candidate block is reached successfully on the first node; and

5 triggering, by the second node according to the notification message, the operation of saving, by the second node, the candidate block in a case that the first transaction information is verified successfully, and the operation of saving the second transaction execution result in a case that the transaction indicated by the first transaction information is executed successfully.

10 12. The method according to any one of claims 9 to 11, further comprising:

receiving, by the second node, the candidate block broadcast by the first node through the blockchain, and obtaining second transaction information from the candidate block;

performing, by the second node, verification on the second transaction information in the candidate block to generate a fourth verification result, and executing a transaction indicated
15 by the second transaction information in the candidate block to generate a fourth transaction execution result;

broadcasting, by the second node, a fourth node processing result through the blockchain, the fourth node processing result comprising the fourth verification result and the fourth transaction execution result; and

20 saving, by the second node, the candidate block in a case that the second transaction information is verified successfully, and saving the fourth transaction execution result in a case that the transaction indicated by the second transaction information is executed successfully.

25 13. A block processing method, the method being executed by a first node in a blockchain, the blockchain further comprising a second node, the first node being a leader node, the second node being a follower node, and the method comprising:

putting, by the first node in response to at least one client transmitting transaction information to the blockchain, the transaction information transmitted by the client into a transaction queue of the first node;

30 checking, by the first node, whether the transaction queue meets a preset block generation condition;

packaging, by the first node in response to the transaction queue meeting the block generation condition, first transaction information in the transaction queue of the first node into a candidate block, adding a signature to the candidate block, and broadcasting the candidate block through the blockchain, wherein the first transaction information in the
5 broadcasted candidate block is not verified by the first node;

performing, by the first node, verification on the first transaction information in the candidate block to generate a first verification result, and executing a transaction indicated by the first transaction information in the candidate block to generate a first transaction execution result;

10 adding, by the first node, a signature to a first node processing result, and then broadcasting the first node processing result through the blockchain, the first node processing result comprising the first verification result and the first transaction execution result;

receiving, by the first node, a second node processing result broadcast by the second node through the blockchain, the second node processing result comprising: a second
15 verification result generated by the second node by performing verification on the first transaction information in the candidate block, and a second transaction execution result generated by the second node by executing the transaction indicated by the first transaction information in the candidate block; and

performing, by the first node according to the first node processing result and the second
20 node processing result, consensus on the candidate block by using a distributed consensus algorithm, saving, by the first node, the candidate block in a case that a consensus on the candidate block is reached successfully, and saving the first transaction execution result in a case that the transaction indicated by the first transaction information is executed successfully.

25 14. The method according to claim 13, further comprising:

packaging, by the first node, second transaction information in the transaction queue into the candidate block while packaging the first transaction information into the candidate block, adding a signature to the candidate block, and then broadcasting the candidate block through the blockchain;

30 performing, by the first node, verification on the second transaction information in the candidate block to generate a third verification result, and executing a transaction indicated by the second transaction information in the candidate block to generate a third transaction

execution result;

adding, by the first node, a signature to a third node processing result, and then
broadcasting the third node processing result through the blockchain, the third node
processing result comprising the third verification result and the third transaction execution
5 result;

receiving, by the first node, a fourth node processing result broadcast by the second node
through the blockchain, the fourth node processing result comprising: a fourth verification
result generated by the second node by performing verification on the second transaction
information in the candidate block, and a fourth transaction execution result generated by the
10 second node by executing the transaction indicated by the second transaction information in
the candidate block; and

performing, by the first node, consensus on the candidate block according to the third
node processing result and the fourth node processing result, saving, by the first node, the
candidate block in a case that a consensus on the candidate block is reached successfully, and
15 saving the third transaction execution result in a case that the transaction indicated by the
second transaction information is executed successfully.

15. The method according to claim 13 or 14, wherein the saving, by the first node, the
candidate block in a case that a consensus on the candidate block is reached successfully
comprises:

20 saving, by the first node in a case that a consensus on the candidate block is reached
successfully, header information of the candidate block and the first transaction information
that is successfully verified, the header information of the candidate block comprising: a hash
value of a previous block of the candidate block, a root of Merkle tree, a root of state, a
receipt root, a signature of node, and a nonce.

25 16. A block processing method, the method being executed by a second node in a
blockchain, the blockchain further comprising a first node, the first node being a leader node,
the second node being a follower node, and the method comprising:

receiving, by the second node, a candidate block broadcast by the first node through the
blockchain, and obtaining first transaction information from the candidate block, wherein the
30 first transaction information in the broadcasted candidate block is not verified by the first
node;

performing, by the second node, verification on the first transaction information in the candidate block to generate a second verification result, and executing a transaction indicated by the first transaction information in the candidate block to generate a second transaction execution result;

5 adding, by the second node, a signature to a second node processing result, and broadcasting the second node processing result through the blockchain, the second node processing result comprising the second verification result and the second transaction execution result; and

10 saving, by the second node, the candidate block in a case that the first transaction information is verified successfully, and saving the second transaction execution result in a case that the transaction indicated by the first transaction information is executed successfully.

17. A blockchain node, the blockchain node being a first node in a blockchain, the first node comprising: a processor and a memory,

15 the memory being configured to store instructions; and

the processor being configured to execute the instructions in the memory, to perform the method according to any one of claims 1 to 8, or perform the method according to any one of claims 13 to 15.

20 18. A blockchain node, the blockchain node being a second node in a blockchain, the second node comprising a processor and a memory,

the memory being configured to store instructions; and

the processor being configured to execute the instructions in the memory, to perform the method according to any one of claims 9 to 12, or perform the method according to claim 16.

25 19. A block processing system, the block processing system comprising: a first node and a second node,

the first node being configured to perform the method according to any one of claims 1 to 8, and the second node being configured to perform the method according to any one of claims 9 to 12;

or

30 the first node being configured to perform the method according to any one of claims 13

to 15, and the second node being configured to perform the method according to claim 16.

20. A computer-readable storage medium, comprising instructions, when run on a computer, causing the computer to perform the method according to any one of claims 1 to 8, or perform the method according to any one of claims 9 to 12, or perform the method
5 according to any one of claims 13 to 15, or perform the method according to claim 16.