CLAIMS

1. A service initiation method based on a consortium blockchain network, wherein the consortium blockchain network comprises a plurality of service nodes, a target service node is a service node in cooperative relationship with the at least one service node, a target client device is any one client device for which the target service node is responsible, the target client device stores a candidate queue corresponding to the target service node, and the candidate queue corresponding to the target service node comprises a node identifier of a service node in cooperative relationship with the target service node;

the service initiation method comprises:

creating, by the target client device, a service-related transaction and sending the service-related transaction to the target service node;

determining, when determining that the target service node does not record the service-related transaction, one node identifier in the stored candidate queue as a designated node identifier; and

sending the service-related transaction to a service node corresponding to the designated node identifier.

2. The method according claim 1, wherein determining one node identifier in the stored candidate queue as the designated node identifier specifically comprises:

determining a first node identifier in the stored candidate queue as the designated node identifier;

sending the service-related transaction to the service node corresponding to the designated node identifier specifically comprising:

performing following steps cyclically until a designated condition is satisfied:

sending the service-related transaction to the service node corresponding to the designated node identifier;

if the designated condition is not satisfied, determining a next node identifier in the stored candidate queue as the designated node identifier;

wherein the designated condition refers to that the service-related transaction is recorded, or the service node corresponding to the N^{th} node identifier in the stored candidate queue does not record the service-related transaction; $N \in (1, M+1)$, M is a number of node identifiers in the stored candidate queue.

3. A method of determining a candidate queue in claim 1 or 2, wherein the consortium blockchain network comprises a plurality of service nodes, the target service node is a service node in cooperative relationship with at least one service node, and the method comprises:

determining, by the target service node, for each service node in cooperative relationship with the target service node, a current performance characterization value corresponding to the service node, wherein the current performance characterization value corresponding to the service node is positively correlated with an amount of current load capacity of the service node and/or is negatively correlated with an amount of current communication delay of the service node;

sorting respective service nodes in cooperative relationship with the target service node in a descending order based on the size of the current performance characterization value corresponding to each service node in cooperative relationship with the target service node, so as to obtain the candidate queue corresponding to the target service node.

4. The method according to claim 3, further comprising:

re-determining, for each service node in cooperative relationship with the target service node, whenever a designated period elapses, the current performance characterization value corresponding to the service node;

updating the candidate queue corresponding to the target service node based on the current performance characterization value corresponding to each service node in cooperative relationship with the target service node.

5. The method according to claim 4, updating the candidate queue corresponding to the target service node based on the current performance characterization value corresponding to each service node in cooperative relationship with the target service node specifically comprises:

re-sorting the respective service nodes in cooperative relationship with the target service node in a descending order based on the size of the current performance characterization value corresponding to each service node in cooperative relationship with the target service node, so as to obtain the updated candidate queue corresponding to the target service node.

6. The method according to claim 4, wherein the target client device is any one client device for which the target service node is responsible;

the method further comprises:

determining, whenever the designated period elapses, for each service node in cooperative relationship with the target service node, a first current relationship characterization value corresponding to the service node;

wherein the first current relationship characterization value corresponding to the service node is used to characterize a frequency that the service node records the service-related transactions sent by the target client device, the higher frequency that the service node records the service-related transactions sent by the target client device indicates the larger first current relationship characterization value corresponding to the service node;

updating the candidate queue corresponding to the target service node based on the current performance characterization value corresponding to each service node in cooperative relationship with the target service node specifically comprises:

determining, for each service node in cooperative relationship with the target service node, a first current comprehensive characterization value corresponding to the service node based on the current performance characterization value corresponding to the service node and the first current relationship characterization value corresponding to the service node; wherein the first current comprehensive characterization value corresponding to the service node is positively correlated with the current performance characterization value corresponding to the service node and is negatively correlated with the first current relationship characterization value corresponding to the service node;

re-sorting the respective service nodes in cooperative relationship with the target service node in a descending order based on the first current comprehensive characterization value corresponding to each service node in cooperative relationship with the target service node, so as to obtain the updated candidate queue corresponding to the target service node.

7. The method according to claim 4, further comprising:

determining, whenever the designated period elapses, for each service node in cooperative relationship with the target service node, a second current relationship characterization value corresponding to the service node;

wherein the second current relationship characterization value corresponding to the service node is used to characterize a frequency that the target service node records the service-related transactions sent by the client device corresponding to the service node, the higher frequency that the target service node records the service-related transactions sent by the client device corresponding to the service node indicates the larger second current relationship characterization value corresponding to the service node;

updating the candidate queue corresponding to the target service node based on the current performance characterization value corresponding to each service node in cooperative relationship with the target service node specifically comprises:

determining, for each service node in cooperative relationship with the target service node, a second current comprehensive characterization value corresponding to the service node based on the current performance characterization value corresponding to the service node and the second current relationship characterization value corresponding to the service node, wherein the second current comprehensive characterization value corresponding to the service node is positively correlated with the current performance characterization value corresponding to the service node and is positively correlated with the second current relationship characterization

value corresponding to the service node;

re-sorting the respective service nodes in cooperative relationship with the target service node in a descending order based on the second current comprehensive characterization value corresponding to each service node in cooperative relationship with the target service node, so as to obtain the updated candidate queue corresponding to the target service node.

8. A service recording method based on a consortium blockchain network, wherein based on a service initiation method in claim 1 or 2, the service recording method comprises:

receiving, by the target service node, a service-related transaction from a client device for which a cooperative service node is responsible, wherein the cooperative service node is any one service node in cooperative relationship with the target service node;

immediately recording the received service-related transaction; or

recording, in delay, the received service-related transaction; or

rejecting the received service-related transaction.

9. The method according to claim 8, wherein immediately recording the received service-related transaction specifically comprises:

immediately recording, if a resource consumption amount for recording the service-related transaction from the client device connected with the cooperative service node is not greater than a first threshold in a designated historical period, the received service-related transaction.

10. The method according to claim ~~8~~9, wherein recording, in delay, the received service-related transaction specifically comprises:

recording, in delay, if the resource consumption amount for recording the service-related transaction from the client device connected with the cooperative service node is greater than the first threshold and smaller than a second threshold in the designated historical period, the received service-related transaction, wherein the first threshold is smaller than the second threshold.

11. The method according to claim ~~8~~9, wherein rejecting the received service-related transaction specifically comprises:

rejecting, if the resource consumption amount for recording the service-related transaction from the client device connected with the cooperative service node is not smaller than a second threshold in the designated historical period, the received service-related transaction.

12. A user operation apparatus, wherein a consortium blockchain network comprises a plurality of service nodes, a target service node is a service node in cooperative relationship with at least one service node, the user operation apparatus is connected with the target service node, the user operation apparatus stores a candidate queue corresponding to the target service node, and the candidate queue corresponding to the target service node comprises a node

identifier of a service node in cooperative relationship with the target service node;

the user operation apparatus comprises:

a transaction creating module, configured to create a service-related transaction and send the service-related transaction to the target service node; and

a processing module, configured to determine one node identifier in the stored candidate queue as a designated node identifier when determining the target service node does not record the service-related transaction; and send the service-related transaction to the service node corresponding to the node identifier.

13. The apparatus according to claim 12, wherein the processing module determines a first node identifier in the stored candidate queue as the designated node identifier; and performs the following steps cyclically until a designated condition is satisfied:

the service-related transaction is sent to the service node corresponding to the designated node identifier;

if the designated condition is not satisfied, a next node identifier in the stored candidate queue is determined as the designated node identifier;

wherein the designated condition refers to that the service-related transaction is recorded, or the service node corresponding to the N^{th} node identifier in the stored candidate queue does not record the service-related transaction; $N \in (1, M+1)$, M is a number of node identifiers in the stored candidate queue.

14. A service apparatus, wherein a consortium blockchain network comprises a plurality of service nodes, the service apparatus is a service node in cooperative relationship with at least one service node, and the service apparatus comprises:

a first determining module, configured to determine a current performance characterization value corresponding to each service node in cooperative relationship with the service apparatus; wherein the current performance characterization value corresponding to the service node is positively correlated with an amount of current load capacity of the service node, and/or negatively correlated with an amount of communication delay of the service node; and

a sorting module, configured to sort respective service nodes in cooperative relationship with the target service node in a descending order based on the size of the current performance characterization value corresponding to each service node in cooperative relationship with the service apparatus, so as to obtain a candidate queue corresponding to the service apparatus.

15. The apparatus according to claim 14, further comprising:

an updating module, configured to: re-determine the current performance characterization value corresponding to each service node in cooperative relationship with the target service

node whenever the designated period elapses; and update the candidate queue corresponding to the target service node based on the current performance characterization value corresponding to each service node in cooperative relationship with the target service node.

16. The apparatus according to claim 15, wherein the updating module re-sorts the respective service nodes in cooperative relationship with the target service node in a descending order based on the size of the current performance characterization value corresponding to each service node in cooperative relationship with the target service node so as to obtain the updated candidate queue corresponding to the target service node.

17. The apparatus according to claim 15, wherein the target client device is any one client device for which the service apparatus is responsible;

the apparatus further comprises:

a second determining module, configured to determine, whenever the designated period elapses, for each service node in cooperative relationship with the target service node, a first current relationship characterization value corresponding to the service node; wherein the first current relationship characterization value corresponding to the service node is used to characterize a frequency that the service node records the service-related transactions sent by the target client device, and the higher frequency that the service node records the service-related transactions sent by the target client device indicates the larger first current relationship characterization value corresponding to the service node;

wherein the updating module is configured to: determine, for each service node in cooperative relationship with the target service node, a first current comprehensive characterization value corresponding to the service node based on the current performance characterization value corresponding to the service node and the first current relationship characterization value corresponding to the service node, wherein the first current comprehensive characterization value corresponding to the service node is positively correlated with the current performance characterization value corresponding to the service node and is negatively correlated with the first current relationship characterization value corresponding to the service node; and re-sort the respective service nodes in cooperative relationship with the target service node in a descending order based on the size of the first current comprehensive characterization value corresponding to each service node in cooperative relationship with the target service node, so as to obtain the updated candidate queue corresponding to the target service node.

18. The apparatus according to claim 15, further comprising:

a third determining module, configured to determine, whenever the designated period elapses, for each service node in cooperative relationship with the target service node, a second

current relationship characterization value corresponding to the service node, wherein the second current relationship characterization value corresponding to the service node is used to characterize a frequency that the target service node records the service-related transactions sent by the target client device corresponding to the service node, and the higher frequency that the target service node records the service-related transactions sent by the client device corresponding to the service node indicates the larger second current relationship characterization value corresponding to the service node;

wherein the updating module is configured to determine, for each service node in cooperative relationship with the target service node, a second current comprehensive characterization value corresponding to the service node based on the current performance characterization value corresponding to the service node and the second current relationship characterization value corresponding to the service node, wherein the second current comprehensive characterization value corresponding to the service node is positively correlated with the current performance characterization value corresponding to the service node and positively correlated with the second current relationship characterization value corresponding to the service node; and re-sort the respective service nodes in cooperative relationship with the target service node in a descending order based on the size of the second current comprehensive characterization value corresponding to each service node in cooperative relationship with the target service node, so as to obtain the updated candidate queue corresponding to the target service node.

19. A service apparatus, wherein based on the service initiation method in claim 1 or 2, the service apparatus is the target service node and comprises:

a receiving module, configured to receive a service-related transaction from a client device for which a cooperative service node is responsible, wherein the cooperative service node is any service node in cooperative relationship with the target service node;

a processing module, configured to immediately record the received service-related transaction, or record, in delay, the received service-related transaction, or reject the received service-related transaction.

20. The apparatus according to claim 19, wherein when a resource consumption amount for recording the service-related transaction from the client device connected with the cooperative service node is not greater than a first threshold in a designated historical period, the processing module immediately records the received service-related transaction.

21. The apparatus according to claim ~~19~~20, wherein when the resource consumption amount for recording the service-related transaction from the client device connected with the cooperative service node is greater than the first threshold and smaller than a second threshold

in the designated historical period, the processing module records, in delay, the received service-related transaction, wherein the first threshold is smaller than the second threshold.

22. The apparatus according to claim ~~19~~20, wherein when the resource consumption amount for recording the service-related transaction from the client device connected with the cooperative service node is not smaller than a second threshold in the designated historical period, the processing module rejects the received service-related transaction.

23. A service processing system, comprising a consortium blockchain network formed of a plurality of service nodes and a plurality of client devices for which each service node is responsible, wherein a target service node is a service node in cooperative relationship with at least one service node, a target client device is any client device for which the target service node is responsible, the target client device stores a candidate queue corresponding to the target service node and the candidate queue comprises a node identifier of a service node in cooperative relationship with the target service node;

the target client device creates a service-related transaction and sends the service-related transaction to the target service node; in response to determining that the target service node does not record the service-related transaction, one node identifier in the stored candidate queue is determined as a designated node identifier; and the service-related transaction is sent to the service node corresponding to the designated node identifier.

24. The system according to claim 23, wherein the target client device determines a first node identifier in the stored candidate queue as the designated node identifier; and performs following steps cyclically until a designated condition is satisfied:

the service-related transaction is sent to the service node corresponding to the designated node identifier;

if the designated condition is not satisfied, a next node identifier in the stored candidate queue is determined as the designated node identifier;

wherein the designated condition refers to that the service-related transaction is recorded, or the service node corresponding to the N^{th} node identifier in the stored candidate queue does not record the service-related transaction; $N \in (1, M+1)$, M is a number of node identifiers in the stored candidate queue.

25. The system according to claim 23, wherein, for each service node in cooperative relationship with the target service node, the target service node determines a current performance characterization value corresponding to the service node; the current performance characterization value corresponding to the service node is positively correlated with an amount of current load capacity of the service node and/or is negatively correlated with an amount of

current communication delay of the service node; the target service node sorts respective service nodes in cooperative relationship with the target service node in a descending order based on the size of the current performance characterization value corresponding to each service node in cooperative relationship with the target service node, so as to obtain the candidate queue corresponding to the target service node.

26. The system according to claim 23, wherein the target service node receives a service-related transaction from a client device connected with a cooperative service node, wherein the cooperative service node is any service node in cooperative relationship with the target service node; the target service node immediately records the received service-related transaction, or records, in delay, the received service-related transaction, or rejects the received service-related transaction.

27. A computer device, comprising a memory, a processor, and computer programs stored on the memory and operable on the processor, wherein the programs are executed by the processor to implement the method of any one of claims 1-11.