CLAIMS

1. A method for sending data message by multiple sending and selectively receiving, comprising:

acquiring a data message to be sent;

adding an identification field to each of the data messages, wherein the identification field comprises a feature code of the data messages and a sequence number in a de-duplication array, wherein the sequence number in the de-duplication array comprises a sequence number distinguishing the data messages to be sent in this round, and the feature code comprises an identifier determining a round of the data messages;

replicating the data messages at least once to obtain at least one copy of the data messages; and

sending the data messages and the copies of the data messages sent respectively via different links.

2. The method for sending data message by multiple sending and selectively receiving according to claim 1, wherein the data messages to be sent are acquired from a communication entity.

3. The method for sending data message by multiple sending and selectively receiving according to claim 1, wherein the step of adding an identification field to each of the data messages further comprises that a high bit of the identification field is the feature code and a low bit of the identification field is the sequence number in the de-duplication array.

4. The method for sending data message by multiple sending and selectively receiving according to claim 1, wherein before the step of adding an identification field to each of the data messages, the method further comprises:

testing a network status of different links via which the data messages and the copies of the data messages are sent; and

setting a length of the de-duplication array based on the network status.

5. The method for sending data message by multiple sending and selectively receiving according to claim 4, wherein the step of setting a length of the de-duplication array based on the network status further comprises:

calculating a delay difference between a link with a best network status and a link with a worst network status; and

setting the length of the de-duplication array based on a product of a packet sending rate and the delay difference.

6. The method for sending data message by multiple sending and selectively receiving according to claim 4, wherein the step of setting a length of the de-duplication array based on the network status further comprises:

calculating a time difference between a moment when a last data message is sent via the link with the worst network status and a moment when a first data message is sent via the link with the best network status in a previous round; and

setting a length of the de-duplication array in this round based on a product of the time difference and the packet sending rate.

7. The method for sending data message by multiple sending and selectively receiving according to claim 1, wherein before the step of adding an identification field to each of the data messages, the method further comprises:

setting a length of the de-duplication array in this round based on a number of data messages sent in a previous round.

8. The method for sending data message by multiple sending and selectively receiving according to any one of claims 4-7, wherein before the step of sending the data messages and the copies of the data messages sent respectively via different links, the method further comprises:

sending a length M of the feature code and a parameter N of the length of the de-duplication array, wherein the length M of the feature code is set based on the parameter N of the length of the de-duplication array, and a lower limit of the length M of the feature code is 1.

9. The method for sending data message by multiple sending and selectively receiving according to claim 1, wherein after the step of sending the data messages and the copies of the data messages sent respectively via different links, the method further comprises:

encapsulating the data messages and the copies of the data messages based on a protocol of the data messages; and

sending the data messages and the copies of the data messages encapsulated via different links, respectively.

10. A method for receiving data message by multiple sending and selectively receiving, comprising:

receiving a data message and at least one copy of data message corresponding thereto via

different links, respectively; and

parsing an identification field in the data message and the copies of the data message corresponding thereto, extracting a feature code in the identification field and a sequence number in a de-duplication array; and

performing a de-duplication judgment in the de-duplication array based on the feature code and the sequence number in the de-duplication array, wherein the sequence number in the de-duplication array comprises a sequence number distinguishing the data messages to be sent in this round, and the feature code comprises an identifier determining a round of the data messages; and

discarding the data message or the copies of the data message if a same element is present in the de-duplication array.

11. The method for receiving data message by multiple sending and selectively receiving according to claim 10, the step of receiving the data message and at least one copy of data message corresponding thereto via different links, respectively, further comprises: receiving, by a network communication module, an encapsulated data message and an encapsulated copies of the data message sent by a sending end from different links.

12. The method for receiving data message by multiple sending and selectively receiving according to claim 10, wherein the step of extracting the feature code in the identification field and the sequence number in the de-duplication array further comprises:

extracting a high bit of the identification field as the feature code, and extracting a low bit of the identification field as the sequence number in the de-duplication array.

13. The method for receiving data message by multiple sending and selectively receiving according to claim 10, wherein the step of performing a de-duplication judgment in the de-duplication array based on the feature code and the sequence number in the de-duplication array, and discarding the data messages or the copies of the data messages if the same element is present in a same position of the de-duplication array, further comprises:

locating a corresponding element in the de-duplication array by the sequence number in the de-duplication array; and

comparing whether the feature code is the same as the element, and discarding the data messages or the copies of the data messages if the feature code is the same as the element.

14. The method for receiving data message by multiple sending and selectively receiving according to claim 10, wherein the step of performing a de-duplication judgment in the de-

duplication array based on the feature code and the sequence number in the de-duplication array, further comprises:

covering, by the feature code, the element in the de-duplication array located using the sequence number in the de-duplication array if the same element is not matched in the de-duplication array.

15. The method for receiving data message by multiple sending and selectively receiving according to claim 10, wherein before the step of receiving the data message and at least one copy of data message corresponding thereto via different links, respectively, the method further comprises:

receiving a length M of the feature code and a parameter N of the length of the de-duplication array,

generating the de-duplication array based on the length M of the feature code and the parameter N of the length of the de-duplication array, wherein a storage space of the de-duplication array is $M \times 2^N$.

16. The method for receiving data message by multiple sending and selectively receiving according to claim 10, wherein before the step of receiving the data message and at least one copy of data message corresponding thereto via different links, respectively, the method further comprises:

setting a length of the de-duplication array in this round based on a number of data messages received in a previous round.

17. The method for receiving data message by multiple sending and selectively receiving according to claim 10, wherein before the step of receiving the data message and at least one copy of data message corresponding thereto via different links, respectively, the method further comprises:

testing a network status of the different links; and

setting a length of the de-duplication array based on the network status.

18. The method for receiving data message by multiple sending and selectively receiving according to claim 17, wherein before the step of receiving the data message and at least one copy of data message corresponding thereto via different links, respectively, the method further comprises:

sending a length M of the feature code and a parameter N of the length of the de-duplication

array, wherein the length M of the feature code is set based on the parameter N of the length of the de-duplication array, and a lower limit of the length M of the feature code is 1.

19. An apparatus for multiple sending and selectively receiving of sending end, comprising:

an acquisition unit configured to acquire a data message to be sent;

an identification field adding unit configured to add an identification field to each of the data messages, wherein the identification field comprises a feature code of the data messages and a sequence number in a de-duplication array, wherein the sequence number in the de-duplication array comprises a sequence number distinguishing the data messages to be sent in this round, and the feature code comprises an identifier determining a round of the data messages;

a replication unit configured to replicate the data messages at least once to obtain at least one copy of the data messages; and

a sending unit configured to send the data messages and the copies of the data messages sent respectively via different links.

20. An apparatus for multiple sending and selectively receiving of receiving end, comprising:

a receiving unit configured to receive a data message and at least one copy of data message corresponding thereto via different links, respectively;

a parsing unit configured to parse an identification field in the data message and the copies of the data message corresponding thereto, and extract a feature code in the identification field and a sequence number in a de-duplication array, wherein the sequence number in the de-duplication array comprises a sequence number distinguishing the data messages to be sent in this round, and the feature code comprises an identifier determining a round of the data messages; and

a processing unit configured to perform a de-duplication judgment in the de-duplication array based on the feature code and the sequence number in the de-duplication array, and discard the data message or the copies of the data message if a same element is present in the de-duplication array.

21. A system for data message multiple sending and selectively receiving, comprising:

a sending end further comprising: a communication entity of sending end, a multiple sending and selectively receiving module of sending end, and a network communication module of sending end; and

a receiving end further comprising: a communication entity of receiving end, a multiple sending and selectively receiving module of receiving end, and a network communication module

of receiving end, wherein

the communication entity of sending end sends a data message to the multiple sending and selectively receiving module of sending end, the multiple sending and selectively receiving module of sending end acquires the data message and adds an identification field to each of the data messages, wherein the identification field comprises a feature code of the data messages and a sequence number in a de-duplication array, wherein the sequence number in the de-duplication array comprises a sequence number distinguishing the data messages to be sent in this round, and the feature code comprises an identifier determining a round of the data messages, replicates the data messages at least once to obtain at least one copy of the data messages; and sends the data messages and the copies of the data messages to the network communication module of sending end; the network communication module of sending end sends the data messages and the copies of the data messages via different links, respectively; and

the network communication module of receiving end receives data messages and at least one copy of data messages corresponding thereto via different links, respectively; the multiple sending and selectively receiving module of receiving end parses the identification field in the data messages and the copies of the data messages corresponding thereto, and extracts the feature code in the identification field and the sequence number in a de-duplication array; and performs a de-duplication judgment in the de-duplication array based on the feature code and the sequence number in the de-duplication array, and discards the data messages or the copies of the data messages if a same element is present in the de-duplication array; and the communication entity of receiving end performs a subsequent processing on the de-duplicated data messages.

22. A computer device, comprising: a memory, a processor and a computer program stored in the memory and runnable in the processor, wherein the method of any one of the claims 1-18 is implemented when the computer program is executed by the processor.

23. A computer-readable storage medium, wherein a computer program is stored on the computer-readable storage medium, and the method according to any one of the claims 1-18 is implemented when the computer program is executed by a processor.